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A
TREATISE
ON THE
NATURE AND CURE
OF
INTESTINAL WORMS
OF THE
HUMAN BODY;

ARRANGED ACCORDING TO THE CLASSIFICATION OF
RUDOLPHI AND BREMSER,
AND CONTAINING
THE MOST APPROVED METHODS OF TREATMENT, AS PRACTISED
IN THIS COUNTRY AND ON THE CONTINENT.

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ILLUSTRATED BY SIX PLATES.

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PREFACE.

IT is somewhat singular, that on the subject of Intestinal Worms,—a subject of some interest to the naturalist, and of considerable importance to the medical practitioner,—no work of any accuracy should have yet appeared in the English language.

Dr Hooper, in the fifth volume of the Memoirs of the London Medical Society, published in the year 1799, gives a very excellent paper on the five species of worms which are found within the intestinal canal of the human body ; but he confines himself entirely to a description

of the external appearance and anatomical structure of these, without giving any information regarding their history, symptoms, and method of cure,—or at all mentioning the different species of worms which inhabit the other cavities and textures of the body.

In 1813, Dr T. Bradly published a small treatise on worms, which is avowedly nothing more than a copy, and not a full or complete one either, of this paper of Dr Hooper's in the London Transactions, with the addition of some meagre and imperfect directions for their cure.

Dr Chamberlain's small work, published in 1784, is written for the express purpose of recommending a particular medicine, the *Stizolobium*, or Cowhage, for the cure of *tænia*, &c. and cannot be reckoned as a general description of worms.

It appeared to me, then, that a work on the nature and treatment of Intestinal Worms was yet a desideratum in this country ; and with a view in some measure of supplying this want the present Treatise has been attempted.

I have adhered to the classification and the generic and specific descriptions of Rudolphi ; and from the work of Dr Bremser have derived that ample information which a persevering attention to the subject for many years, and a most extensive experience in the practical part, have enabled him to afford to his readers.

I have also occasionally adopted the minute and, in most respects, the accurate anatomical descriptions of Dr Hooper. Along with a view of the mode of cure adopted by Dr Bremser, I have also given the most approved practice followed in this country.

The drawings have been executed by Captain T. Brown, F. R. S. E., whose intimate knowledge of natural history enables him to delineate the different objects with an accuracy and fidelity beyond the power of the mere copyist.

I have to express my acknowledgments to Dr. Monro, for the obliging manner in which he afforded me access to the collection of worms in the Anatomical Museum of the University of Edinburgh; to Mr M'Kenzie, surgeon, for permission to avail myself of some minute dissections made by him; and to Dr Mackintosh, for an opportunity of inspecting several curious specimens in his possession.

Edinburgh, 1st November, 1828.

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INTRODUCTION.

THE ancient medical writers were little conversant with the nature of intestinal worms. Hippocrates and Celsus, in different parts of their writings, mention them briefly; but they do not seem to have paid particular attention to them, or discriminated the different species with any degree of minuteness.

Franciscus Redi, physician to the Grand Duke Cosmo III. de Medicis, must be regarded as the founder of this particular branch of science. In 1708, he published the result of his inquiries, in a volume entitled, “*De Animalculis Vivis quæ in Corporibus Animalium Vivorum*

reperiuntur.” In the latter part of the last century also, Pallas, Otto Frederic Müller, and Otto Fabricius, turned their attention to intestinal worms, and Linnæus gave them a place in his System of Nature. A scientific society in Copenhagen, in 1780, began to investigate the nature and habits of these animals; and Bloch and Goëze, in Germany, did much to forward the study, and to arrange and classify the different species. In 1800, Zeder, an industrious and accurate naturalist, published his system of classification, arranging them into orders, genera, and species; and Rudolphi, taking up the subject, and improving and amplifying the classification of Zeder, produced his great work, the “Systema Entozoorum,” the most complete in the arrangement, the classification, the number of species, and the accuracy of description, which has yet been given to the scientific world. Among the numerous treatises which have appeared on the continent, on the intestinal

worms which are found in the human body, the work of Dr Bremser, published at Vienna in 1819, is by far the most ample, correct, and satisfactory in its details; and, in the language of Rudolphi, is thus appropriately characterized, “*Liber egregius, qui brevi omnium in manu erit, et sui parem non agnoscit, neque facilè inveniet.*” In this country the subject of intestinal worms seems hitherto to have met with little attention. With the exception of Dr Hooper’s paper in the *Memoirs of the London Medical Society*, and some few practical statements to be found in the various medical journals, no progress towards illustrating this branch of medical science has been made amongst us.

In the following treatise, the classification of Rudolphi, as given in his “*Synopsis Entozoorum*,” published at Vienna, in 1819, is adhered to. The order, genus, and species, is given after each individual; but it was deemed more convenient for description to arrange them

under the two distinctions of those worms found within the alimentary canal, and those found in the other cavities and textures of the body.

A
TREATISE

ON
INTESTINAL WORMS OF THE HUMAN BODY.

**OF THE FORMATION OF WORMS IN THE
INTESTINES.**

SUCH is the disposition in nature for the support of animal existence, under every variety of circumstance, and in every possible situation, that all animals, even down to very minute species, have other animals, still smaller, which inhabit their bodies, and derive their nourishment, and live and propagate their species in their various textures.

Of these parasitical animals, which are found among the various classes of the animal kingdom, Rudolphi enumerates 1100 different species. Some of these worms are common to

several classes of animals, but others again are peculiar to, and only found in, one particular species.

The *ascaris lumbricoides*, or large round worm of the human species, is to be met with also among pigs, horses, and cows; whereas the two species of tape-worm found in the human body are distinct from those of all other animals.*

Every different structure and cavity of animal bodies will be found liable to be tenanted by these animals; and, for the most part, to be exclusively inhabited by a particular species. There have been worms found in the brain, in the lungs, in the liver, the biliary ducts, and even in the heart itself; and Hopkinson and Morgan discovered a species of worm, (the *filaria papillosa*) in the anterior chamber of a horse's eye. We find, also, in the 10th volume of the Transactions of the Royal Society, another worm, which is described by Captain Brown as a new species, the *ascaris pellucidus*, which also inhabits the eyes of horses in India, and may be seen

* Bremser.

swimming about in the aqueous humour with great activity.

It sometimes happens that the eggs and larvæ of various insects get introduced into the body, and are there developed ; but these are not to be confounded with the animals which are peculiar to, and exist and propagate their species in, the cavities of the human body. It is of these latter that a particular description is proposed to be given in the following pages.

That the intestinal worms of the human body are of a peculiar kind, and different from any which are found to exist in the earth or water, is sufficiently evident, from their distinct and peculiar formation,—from their living and propagating their species in the body,—and from their incapability of sustaining life, for any length of time, if removed out of it. These worms, when exposed to cold air or water, very quickly die ; whereas, had they previously existed in the earth or water, the change could not have so completely affected them.

If they were not distinct worms, but came from without, why not also inhabit the same

parts of the body promiscuously? Whereas it will be found, that some of the species live in the small intestines, and others again always in the large.

Another question not so easily settled is, In what manner these worms originate in the body? Whether the eggs of the different species are conveyed from one subject to another, through the medium of the food, the drink, or the air,—or whether they have their origin in the bowels, by what is called a *primitive* or *spontaneous formation*? Dr Bremser, and some of the other continental writers on the subject, combat the opinion of the propagation of intestinal worms by the transmission of eggs from one body to another; and the former supports his hypothesis by many ingenious arguments. Dr Bremser thinks it very improbable that the eggs can be transmitted through the medium of the aliments, the water, or the air, in the case of intestinal worms, and still more so in the case of hydatids, and some other species of animals, which are found in the different cavities of the body, where no external opening or access could be afforded them. He

mentions an experiment made by Schreiber, who fed a polecat, the *mustela putorius* of Linnæus, for six weeks, with milk, containing the eggs, and also the various species of intestinal worms; at the end of that period the animal was killed, but, to the astonishment of every body, not a worm was found in its body. He also adduces in favour of his argument, the facts given on credible authority, that worms have been found in the intestines of new-born children.

Kerkings mentions, that he saw a foetus whose intestinal canal was almost filled with worms; and in the stomach of another infant, six and a half months old, he found several of the ascarides, or round worm, of a larger bulk than usual.

Pallas and Bloch assure us, that Brendel and Reim found tæniæ in the foetus; and Blumenbach saw a tænia in a new-born foal.

It was the opinion of Hippocrates, too, that worms were generated in the foetus while *in utero*; and we can glean from his writings, that he entertained the opinion that intestinal worms were produced by a spontaneous formation.

Dr Bremser, then, is of opinion, that a certain predisposition in the system, and a peculiar state of the intestinal canal, are necessary to the propagation of worms. When this peculiar state exists, he supposes that the animal matter undergoes a particular process,—assumes a new form of existence,—and hence are produced the various species of worms;—that these worms, when once thus formed in the body, have the power of propagating their species in the usual manner; but that their origin, in every body, is at first by this *primitive* or *spontaneous formation*.

Now, there are many objections to this hypothesis of Dr Bremser,—for it is a mere hypothesis, unsupported by one single fact; and the most obvious are the following:—

In the first place, It is contrary to all analogy drawn from the animal kingdom. In no other class of animals is there an instance of spontaneous formation; for the animalcula discovered by the aid of a microscope in vinegar, and various other fluids, have never been sufficiently investigated, to permit us to place them among

the list of living animals ; nor, if they were, is it to be taken for granted, that even these are formed spontaneously.

If we admit that such an animal as the *ascaris lumbricoides*, or large round worm, having such a perfect and complicated structure, and being furnished with a head, a stomach, intestinal canal, a series of vessels subservient to generation, and muscles and skin, could be formed by any spontaneous action, or combination of animal particles, there would be no end to the extension of the theory. A field of meadow grass, by the spontaneous arrangement of its particles, might produce an ox ; or the fermenting dunghill, charged with animal particles in abundance, might be the matrix from whence sprung the hog that feeds on it. The theory would be more plausible were these worms found incapable of reproduction ; whereas they will be found furnished with organs of generation, complete in every respect, by which they propagate their various species,—an instance of two separate and distinct provisions for accom-

plishing the same end, which, we believe, nature is rarely or never accustomed to bestow.

If these worms had their origin in a spontaneous formation, how comes it that they should be of different species and forms, and inhabit different portions of the intestines; that one kind should feed only on pure chyle, and another prefer the fæces, after being carried to the lower intestines, and mixed with the various juices of the alimentary tube?

How comes it that the *tæniæ* and the *ascari-des*, both inhabiting the *ilium*, and both feeding on pure chyle, should, if produced from the very same materials, in the very same portion of the intestines, be so diametrically opposite in figure and anatomical structure? How should the *trichocephalus*, or long thread-worm, and the *oxyuris*, or maw-worm, both inhabiting the *rectum* and *cæcum*, and both feeding on the same aliment, differ in size and formation so remarkably? It cannot be answered, that these different species are found at different periods of life, and, consequently, under different circum-

stances ; for the two latter species are often found existing at the same time in one individual ; and there are instances where three distinct species have been voided from the same person at once.

Dr Bremser saw a girl, of six years of age, who was taking medicines for the cure of *tænia* ; and who, during the course of treatment, passed, at different times, a number of *ascarides*, *oxyures*, and a *trichocephalus*.

The fact of one particular species of intestinal worm being more prevalent in one country or district than another, is also difficult to be accounted for on Dr Bremser's theory ; and that the Guinea worm is to be found only within the tropics, would show that the existence of this singular species, like that of many other animals, is dependent on climate and situation. For Europeans going to live within the tropics are as subject to Guinea worm as the natives ; and although it has been repeatedly brought into this country by individuals labouring under the disease, it has never become here a common or prevailing affection.

It is certainly a singular circumstance, and not easily to be accounted for, that worms should be found in the intestines of children immediately after birth; but this solitary fact is not sufficient to support a general theory. Of the experiment made on the polecat, it may be observed, that undoubtedly a certain state of the system and bowels is necessary to favour the production of intestinal worms; and that a healthy state of the bowels is sufficient to resist them, even should they be introduced, either alive or in the state of eggs, as was practised in this experiment.

On the other hand, Pallas has demonstrated by experiment, that worms may be propagated by the insertion of their eggs into the body. By a small incision, he introduced into the abdominal cavity of a dog the eggs of a *tænia* from another dog; and, after the expiry of a month, he found young *tæniæ* in the cavity. In this case, not being within the intestine, they were not liable to be expelled by the healthy action of the bowels; and the natural warmth and moisture of the abdomen favoured their production.

The arguments which Dr Bremser adduces in support of his opinion are only of a negative nature. He denies the probability of the transmission of the various species of worms, or their eggs, from one body to another, through any medium or means whatever; and hence resorts to a theory to account for their spontaneous formation. But is there, after all, such an improbability in the supposition, that the eggs of these animals may be transmitted from one body to another, through the medium of the various kinds of food, of water, and of the air? Is it even improbable, that some of the species may not be transmitted by direct communication, as in the case of the oxyures and trichocephalus, while at stool, &c.? There is nothing impossible or unlikely in supposing their transmission by some of these means; but, on the contrary, many analogous circumstances to favour the idea. It is true, it is difficult to account for the existence of various species of worms which inhabit some of the cavities of the body, which are excluded from any direct communication externally. Yet, it is possible, the extremely

minute ovula, or eggs of these animals, may be carried to these cavities by the absorbent vessels—through the medium of the blood-vessels—or by some of those animals puncturing and penetrating the external skin, as is supposed to be the case with the *filaria medinensis*, or Guinea worm. This, like many other mysteries of nature, is wrapt in obscurity; and we can only throw out surmises, until a more satisfactory theory shall be produced. We find that the pholaides, a genus of testaceous worms, without being furnished with any instrument which anatomical dissection discovers, can penetrate rocks of the hardest limestone, under the sea; and, by a continuance of this process, they increase their habitations until they become solitary prisons, from which they can never escape.

There can be no doubt, that a peculiar state of the body, and of the intestinal canal in particular, to be afterwards mentioned, is necessary for the due development of intestinal worms; so that the eggs may often proceed through the passages, without having time to assume life and become worms; and that it is only at par-

ticular periods, and under peculiar circumstances, that they do so, in the same manner as we find the various seeds of plants and vegetables carried about by the winds, and only resting in those particular spots which suit their nature, or afford them an abiding place; for it has been found, that the small seeds of plants may remain for many years buried deep in the earth, and still retain their life and power of springing, when again placed under favourable circumstances for doing so.* Indeed, we find, by established laws in the economy of nature, that all animals produced from eggs, or which undergo a metamorphosis, as is the case with insects and worms, have a certain fixed and invariable time necessary for their lying in embryo, and for the development of each particular species; and, from all we are acquainted with, such embryo would remain for ever dormant, if removed from the locality appro-

* Sir Thomas Dick Lauder made some interesting and decisive experiments to this effect, an account of which was published at Edinburgh, in 1817.

priated to them by nature, unless they shall again be replaced into a situation favourable to their animation. In support of this theory, we are informed by Captain Brown, that, in the year 1818, he procured a quantity of the eggs of the silkworm-moth, the *phalæna mori* of Linnæus; he laid these aside in a wooden box into a damp cellar, where they remained until the summer of 1820, when he placed them in the sun, and they were speedily brought to the larvæ, or caterpillar state.

OF THE CAUSE OF THE FORMATION OF WORMS.

A GENERAL laxity and debility of the whole system, but more especially a feebleness of the intestines, is the disposition of body which is most prone to the affection of worms.

A want of due harmony, too, between the several parts of the alimentary system, an imperfect digestion of the food, and a deficiency of the various juices necessary for converting this food into nourishment, or an over-active digestion, producing more alimentary matter than the absorbent vessels can take up, are both equally favourable to the production of worms.

When the nutritious matter taken into the stomach is imperfectly digested, when there is a deficiency of the necessary fluids for this important purpose, and more especially when there

exist a feebleness and torpidity of the stomach and alimentary canal, the imperfectly-digested chyle accumulates in the bowels, passes into a state of fermentation, gives rise to an undue quantity of mucous matter, and affords a favourable opportunity for the development of the various worms which feed on the chyle, and find an easy lodgment in the bowels, from their impaired action and diminished peristaltic power. On the other hand, when the digestive powers are over-vigorous, when a greater quantity of nutritious matter is prepared by the active state of the stomach, than the absorbent vessels of the system can take up, this alimentary matter accumulates on the internal coats of the intestines, and thus becomes favourable for the production of worms. It is from this cause that we occasionally find robust and healthy people affected with this disease ; and this constitutional temperament, or predisposition to this disease, may be often transmitted from one person to his descendants ; thus exemplifying the hereditary tendency to worms which writers have remarked.

It will be found, that all young children, and females generally, are more subject to worms than men, because their lymphatic system is more feeble, and their constitutions less firm and robust.

Infants, too, which are not nursed by the breast, from generally getting too large a proportion of food, and from the consequent imperfect digestion, are found to be often affected with worms.

Scrofulous children, from the aliment not being taken up by the torpid and diseased absorbents, are particularly liable to worms.

Of the concurring causes which favour the formation of worms may be mentioned a sedentary and inactive life,—a damp and unaired, or generally unhealthy situation,—a nourishment from which a too nutritious chyle is prepared, as fat substances, farinaceous food, and milk, and substances prepared from it.

The sedentary life of females, in addition to their delicate constitutions, may also favour the production of worms in them.

It will be found, that the inhabitants of some countries, and even some districts of the same country, are much more liable to worms than others ; and this cannot always be well accounted for from any peculiar local or concurrent causes.

No two countries can well be more different in situation and climate, than that of the level, moist, and marshy plains of Holland, and the keen, pure, and elevated atmosphere of the Swiss Alps ; and yet the inhabitants of both these countries are peculiarly liable to worm affections.

The Hollanders are very subject to worms ; and it has been attributed to their moist climate, the general use of fish, and also of a milky and farinaceous diet. The inhabitants of Savoy are also peculiarly liable to worms ; and these, as well as those of most of the Swiss cantons, live much on milk, butter, and cheese.

Pallas is of opinion, that the inhabitants of cities are more liable to worms than those of the country ; and that all animals which live on flesh

are more subject to the disease than the graminivorous species. Bremser, on the other hand, has frequently found great numbers of intestinal worms among the graminivorous animals; and imputes the greater prevalence of worms among the inhabitants of cities to their luxurious mode of living, want of due exercise, and consequent derangement of the digestive organs.

When considering the nature of diet, as affecting the disease, it must be borne in mind, that much depends upon the constitution, the habits of life, and individual peculiarities, as influencing the state of digestion, and the consequent healthy action of every department of the alimentary system. But that certain kinds of diet have an effect in predisposing the body to the disease is confirmed by daily experience and observation.

Of diet of this description may be mentioned all crude raw vegetables, and unripe fruits, when taken in undue quantity, as is often the case with children.

Too much saccharine matter, too, would appear to be favourable to the production of

worms; as, from Mr Chamberlin's work,* it would appear, that the negroes, who are fed principally on the juice of the sugar-cane and molasses, &c. are extremely liable to worm-affections.

A milk diet, too, has been thought favourable to the disease. At all events, cheese, as being hard of digestion, and butter, from its nutritive oily qualities, may, when eat in too great quantity, be somewhat favourable to the production of worms. A German writer has mentioned, that among the children at Salsburg, whose diet consists of milk, rye-bread, and potatoes, worms are very prevalent.

It is probable, too, that a diet not sufficiently stimulating, as one entirely composed of farinaceous and vegetable matter, may be followed by the same consequences. Salt, from its stimulating qualities, is known to be a preventive of

* From this cause, also, children who are crammed with a variety of sweetmeats, where sugar forms the principal ingredient, are often found to have worms in great abundance.

worms. Lord Somerville, in his address to the Board of Agriculture, relates the following circumstance:—"The ancient laws of Holland ordained men to be kept on bread alone, *unmixed with salt*, as the severest punishment that could be inflicted upon them in their moist climate. The effect was horrible; these wretched criminals are said to have been devoured by worms engendered in their own stomachs." Salt, too, when given to graminivorous animals, besides its other beneficial effects as a stimulant, is of advantage in causing the destruction of the various intestinal worms to which this class of animals are liable. For this purpose it has also been used as a remedy for sheep with diseased livers; which disease is frequently caused by the lodgment of a peculiar worm in that viscus.

Those, too, who are in the habit of using alcohol, or spirituous liquors, in their various forms, are found to be less liable to the attacks of worms. And even these animals have been expelled from the intestines by using these liquors as a remedy.

It has been already remarked, that a too nutritious diet, under a particular state of the bowels and alimentary vessels, may be favourable to the production of worms. But it does not appear, that a deficiency of food, or a meagre diet, has this effect.

Some countries, it has been before observed, are more liable to worm-diseases than others. And some particular species of worms are prevalent in one country or district, and rarely or never seen in others. The Germans, a great part of the inhabitants of France, the Italians, the Tyrolese, have the *tænia solium*, or common tape-worm. In Russia, Poland, and Sweden, again, the *tænia lata*, or broad tape-worm, prevails. The former species, too, is more common in this country, although the broad tape-worm is not unfrequently met with. And the Guinea worm, which is situated in the cellular membranes under the skin, is confined to those countries under the tropics.

Another circumstance to be remarked is, that the period of childhood is particularly subject to worm-affections; and at this period two cer-

tain species of worms will be found to inhabit the intestines, which are not so generally found in after-life.

In fine, then, it would appear, that these worms, under favourable circumstances, propagate in the intestines, for they are furnished with organs for that purpose ; but when these circumstances are no longer in existence,—when the young get older, and their constitutions become more confirmed,—when adults change to a more favourable climate,—when the mode of life, or certain articles of diet are altered, then these animals disappear.

OF WORMS WHICH INHABIT THE
INTESTINAL CANAL.

I. TRICHOCEPHALUS.

PLATE I. FIG. 1—5.

Trichocephalus Dispar, Rudolphi Entoz. order 1. Nematoides, genus iii.

Generic Character, Corpus teres, elasticum, parte antica capillari subito in crassiorem transeunte ; os orbiculare ; genitale masculum simplex, vaginatum.

Specific Character, Parte capillari longissima ; capite acuto, indistincto ; corpore maris spiraliter involuto,—feminæ subrecto.

Morgani, Epist. Anatomica xiv. art. 42.

Ræderer, et *Wagler*, L. C. Trichuris.

Goeze, Eingeweidew, p. 112. tab. vi. fig. 1. 5. *Trichocephalus Hominis*.

Gmelin, Syst. Nat. p. 5037, No 1. *Trichocephalus Hominis*.

Werner, Verm. Intest. p. 84. *Ascaris Trichiura*.

Bloch, Eingew. p. 32. fig. 7—9.

Joerdens, Helminth. p. 17. tab. i. fig. 6. 10. *Trichocephalus Hominis*.

Brera, Vorlesung, p. 16. tab. iv. fig. 1—5. Der Haarkopf.

Zeder, Anleit, p. 69. *Mastigodes Hominis*.

Hooper, Memoirs of Lon. Med. Soc. vol. v. p. 252. *Trichuris Vulgaris*—the long thread-worm.

Bradly, Treatise on Worms, p. 72. p. iii. fig. 1—3. The long thread-worm.

Cuvier, Regne Animal, t. iv. p. 31. *Trichocephale de l'Homme*.

De Lamarck, Anim. sans Vert. tom iii. p. 212. *Le Trichiure de l'Homme*.

Encyclopédique Méthodique, art. Vers, p. 99. pl. 33. fig. 1—4. *Trichuris Hominis*.

Turton's Linné, iv. p. 20. *Trichocephalus Hominis*—called by the Germans der Peitschenwurm.

TRICHOCEPHALUS DISPAR,

THE LONG THREAD-WORM.

THIS worm, when full grown, is in breadth the sixteenth part of an inch, and in length from one and a half to two inches. The anterior part of the worm is small and capillary, forming two-thirds of its length: it terminates in an acute point, where the mouth is situated. (Plate I. figs. 2. and 4. c. and f.) The posterior part swells out to a considerable size; and, in the male, is twisted round in a spiral form. (Plate I. fig. 2. d.) The alimentary canal runs in a direct line from the anterior capillary part, which is striated crossways, extending through the posterior thick part to the tail. In this posterior part are found the spermatic vessels convoluted, or folded back upon themselves, and

which terminate at the extremity of the tail ; in the male, (Plate I. fig. 1. 2. 5.) in a small transparent tube or penis ; in the female in a kind of vagina. (Plate I. fig. 3, 4.)

The male is a little smaller than the female, and so pointed towards the commencement of the head, that the opening of the mouth is scarcely perceptible. The female is distinguished from the male by having a somewhat longer anterior capillary part, and from the posterior part being rarely found bent in a spiral form. In this posterior part, in the female, are found the oviducts and eggs, of an elliptic form, placed about the intestinal tube. There is at the extremity a small opening, which may serve at the same time for anus and vagina.

This animal is supplied with a cuticle, a cutis or true skin, and a set of annular muscles : its colour is most generally white, although sometimes assuming the tinge of the aliments among which it is found.

This species is found generally in the large intestines, but most frequently in the cœcum : occasionally they are to be met with in the rec-

tum; and some report that they have found them in the jejunum, and inferior part of the ilium.

They exist in considerable numbers in the same patient. Rudolphi found more than a thousand in one female. Dr Bremser had a girl of six years under treatment for *tænia*, who, during the exhibition of the medicines, passed at different times a number of *ascarides*, *oxyures*, and a *trichocephalus*.

The *trichocephalus* was not known to the ancients, or, at least, not distinguished by them from the small *oxyures*. It was first discovered, in 1761, by Røederer, at Gottingen, and named by him *trichuris*.

Dr Hooper also discovered it subsequently in England, and gave a minute description of one of this species in 1799. It was at first supposed that the small capillary part was the tail of the animal; hence the name *trichurus*, or hair-tailed, and the French appellation of *le ver à queue*; it is now, however, sufficiently established, that the head is situated at the termination of the small capillary tube. Hence Dr Hooper's,

as also Dr Turton's, in his translation of the *Systema Naturæ*, and some of the German writers' description of the animal is erroneous. It is called *trichocephalus*, from the Greek words *τριχος* and *κεφαλή*, capillary or hair-headed.

This species is oviparous, and consists of male and female.

II. OXYURIS.

PLATE I. Fig. 6—10.

Rudolphi, Entoz. order 1. Nematoides. *Ascaris Vermicularis*—the Oxyuris of *Bremser*.

Generic Character, Oxyuris, genus iv. Corpus teres, elasticum; parte postica (feminæ) subulata; os orbiculare; penis vaginatus.

Specific Character, Capitis obtusi, membrana laterali utriusque vesiculari; cauda maris spirali obtusa,—feminæ, subulata recta.

Bloch, Abhandl. s. 31. *Ascaris Vermicularis*. Der Afterwurm.

Müller, Hist. Verm. I. 2. p. 6. tab. 34.

Goeze, Engeweidew, s. 102. 106. tab. 5. fig. 1. 5. Der Menschliche Pfriemenschwanz.

Werner, Vermes Intes. p. 72. fig. 133. 157. *Ascar. Vermicularis*.

Gmelin, Syst. Nat. p. 3029. *Ascar. Verm.*

Joerdens, Helminthol. p. 19. tab. II. fig. 1—5. *Ascar. Verm.* Der Afterwurm.

Zeder, Anteitnng. p. 107. n. *Fusaria Vermic.*

Brera, Vorlesung, p. 18. tab. iv. fig. 7. 11. Ascaride Vermiculare.

Hooper, Memoirs of London Med. Society, vol. v. p. 245.

Ascaris Vermicularis—the maw or thread worm.

Bradly, A Treatise, p. 56. plate iii. fig. 1, 2, 3. The maw or thread worm.

Encyclopédique Méthodique, art. Vers, p. 90. pl. 30. fig. 25—29. *Ascaris Vermicularis*.

Cuvier, Regne Animal, t. iv. p. 33. L'Ascaride Vermiculaire.

De Lamarck, Anim. sans Vert. t. iii. p. 104. L'Oxyure Vermiculaire.

Turton's Linné, iv. p. 11. *Ascaris Vermicularis*.

The *Ασκαρίδες* of the Greeks.

Called by the *Dutch*, Aarsmade—the *Danes*, Smaa Spolorme, Boerneorm—the *Swedes*, Barnmask—the *English*, the *Bots*—*French*, Ascarides.

OXYURIS VERMICULARIS,

THE MAW OR THREAD WORM.

THE male of this worm is in length about one line to one line and a half, and of the thickness of a piece of fine thread, very elastic, and of a white or yellowish colour. The head is obtuse, and covered with a thin transparent membrane, in the middle of which is a small aperture, where is perceived a straight tube, which is the œsophagus of the animal. The body becomes gradually thicker towards the tail, which is convoluted, or turned up in a spiral form. (Plate I. fig. 8, 9.) The alimentary canal extends from the head to the tail of the animal, commencing in an œsophagus, gradually swelling out into a small bag, which is the stomach, and again contracting, and assuming a spiral form towards the tail. The spermatic vessels of the male,

which surround the alimentary canal, are but very indistinctly seen, even with the aid of a powerful microscope.

The female is larger and longer, by three or four lines, than the male, which it resembles exactly in the structure of its anterior part, till the place where the stomach terminates. At this place the alimentary canal is surrounded on both sides by the oviducts, which swell it out considerably. The body then suddenly contracts in diameter, and gradually tapers away to the tail, which is bodkin-shaped, and so fine as scarcely to be perceived by the naked eye. (Plate I. fig. 6, 7.) About two lines from the head, Dr Hooper describes a small punctiform aperture, which is the termination of the uterus or the vagina of the animal.

Plate I. fig. 11. represents a portion of the worm greatly magnified, showing the oviducts containing the eggs. See also Plate II. fig. 1., which shows the oviducts convoluted around the alimentary canal marked A.

The integuments of this worm consist of cuticle, cutis, and a set of annular muscles. It is

very vivacious and quick in its movements. The head is the first part which the animal puts in motion, turning it in every direction; sometimes forming a circle, at other times the figure of eight; but most frequently its tail appears fixed, whilst it turns its body sometimes to one side, and sometimes to another. Some writers describe them as jumping from one place to another; hence the ancient Greek name *ασκαριδες*, from *σκαριζειν*, *saltare*, to leap.

A variety of the female of this species is represented in plate I. fig. 10. Their general situation is the rectum; and they are found most frequently in children; they are also occasionally found in the cœcum and colon. Bloch reports, that Wulf found a great number in a sac formed in the coats of the stomach. Brera found them in the œsophagus of a female in great quantity. They also sometimes make their escape from the anus, and enter the vagina, the bladder, and the urinary passages; but the reports of their having been found in the ventricles of the brain are extremely doubtful.

Goeze, and many other writers, maintain,

that the oxyures are viviparous. Hooper is of the same opinion, from observing the eggs of these animals in continual motion. Rudolphi and Bremser, however, are of opinion, that they are oviparous. In the rectum of frogs and toads there are found worms which are certainly viviparous ; but they are of a different species from those in the human intestines.

This worm was known to the ancient medical writers.

III. ASCARIS.

PLATE I. FIG. 12., and PLATE II. FIG. 2—8.

Rudolphi, Entoz. ord. 1. Nematoides, genus ix. *Ascaris Lumbricoides*.

Generic Character, *Ascaris*. Corpus teres, elasticum, utrinque attenuatum. Caput trivalve. Genitale masculinum spiculum, duplex.

Specific Character, Capite nudo, corpore utrinque sulcato, cauda obtusiuscula.

Bloch, Abhandlung, p. 29. tab. viii. fig. 4—6. *Ascar. Lumbricoid*.

Goeze, Eingeweidew, p. 65. tab. i. fig. 1—3. *Ascar. Gigas*.

Werner, Verm. Intes. p. 75. tab. vii. fig. 153—159. *Ascar. Lumb*.

Gmelin, Syst. Nat. p. 3029. No 2. *Asc. Lumb*.

Zeder, Nachtrag. p. 25. *Fusaria Lumbricoides*.

Joerdens, Helminth. p. 22. tab. ii. fig. 6. 15. *Asc. Lumb*.

Brera, Vorlesung, p. 21. tab. v. fig. 1—11. *Lombr*.

Encyclopédique Méthodique, art. Vers, p. 90. pl. 30. fig. 4. *Ascaris Lumbricoides*.

Hooper, Memoirs of London Medical Society, vol. v. p.

233. *Ascaris Lumbricoides*—the long round worm.

Bradly, A Treatise, &c. p. 34. tab. 1. The *Ascar. Lumbr.*
—the Round Worm.

Cuvier, Regne Animal, t. iv. p. 33. L'*Ascarid Lombrical.*

De Lamarck, Anim. sans Vert. t. iii. p. 207. L'*Asc. Lomb.*

Turton's Linné, iv. p. 11. *Ascaris Lumbricoides.*

The ἄλμινς στρογγύλα of the Greeks.

The *Germans* call it Rundwurm—the *Dutch*, Ronde-worm, Menschenworm, Kenderenworm—the *Danes*, Menneskeorm, Spolorm, Skolorm—the *Swedes*, Men-nisko-mask, Spolmask—the *English*, Round Worm, large Round Worm—the *French*, Lombric des Intestines, Strongle—the *Italians*, Verme Rondo Combrico—the *Spaniards*, Lombrig—the *Portuguese*, Lombriga.

ASCARIS LUMBRICOIDES,

THE LONG ROUND WORM.

THIS worm is about the thickness of a goose quill, and from six to ten and even fifteen inches in length. Small ones, of the length of an inch and a half, are rare. The colour is generally a brownish red, but it varies considerably : it is clear or dark according to the nature and colour of the aliment with which the animal is filled. They are of a red colour sometimes, as if they had been sucking water tinged with blood. When recently passed, they are quite transparent, and the viscera and organs of generation may be distinctly seen through the integuments ; they soon, however, assume a light and opaque yellow tinge.

The head (plate II. figs. 3 and 4., and plate I. fig. 12. a.) is distinguished from the rest of

the body by a circular depression or contraction. It is furnished with three lobes or valves, which open and shut at the will of the animal; when opened, they present in the centre a small tube, which is the opening of the mouth. The body is cylindrical, tapering towards the two extremities, the end where the head is situated being rather the smaller; there is on each side, extending the length of the body, a small groove or depression; between these two lines are other two very faintly-marked lines, running parallel with the former. The intestinal canal extends along the whole length of the animal, and is distinguished by its brown colour: it terminates by a transverse fissure in the anus, situated within a very short space of the tail. (Plate I. fig. 12. b.) Fig. 5. plate II. is a magnified view of the anus.

The male is smaller than the female, and is distinguished from the latter by having the end of the tail bent, as in plate II. fig. 7. The apparatus of generation of the male is much less in size than that of the female. A magnified view of the curved tail of the male, with the bifurcated penis projecting, is seen Plate II. fig. 6.;

and a tail of the natural size, showing the curved termination, is represented at plate II. fig. 7.

The female is larger than the male, and the organs of generation fill as it were the whole cavity of the worm. The tail, too, is straight, as in plate II. fig. 8. Near the middle of the body, rather towards the head, is an annular depression or ring, of about one-fourth of an inch in extent, in which is a very small aperture, which is the vagina. (Plate I. fig. 12. g.) This vagina, or small tube, soon becomes larger, when it commences uterus, (plate II. fig. 2. a.) and branches out into two large crura, which, for the space of four or five inches, are continued of a uniform diameter; they then suddenly become much diminished in size, and appear like opaque threads, lying over and embracing in a convoluted manner the intestinal tube in the middle. This convoluted apparatus is composed of very fine transparent membranes, and is distended with innumerable ovula or eggs. The large voluminous tubes are most probably the oviducts, which Zeder calls the matrix; the smaller folds

are the excretory ducts for the eggs,—for these worms are ascertained beyond doubt to be oviparous.

The integuments of this worm are composed of a cuticle, which is strong, elastic, thin, and of a smooth and transparent texture, and is easily separated from the parts beneath by maceration. Under the cuticle is the cutis, or true skin, somewhat thicker than the former; it is also very strong, elastic, and transparent. On removing this membrane, the muscles present themselves. These do not completely surround the body of the worm, but are two distinct orders of muscular fibres, acting as antagonists to each other; for the two longitudinal lines, which extend from one extremity of the worm to the other, are each of them composed of two distinct tendons, separable from one another. These tendons serve for the attachment of the semilunar muscles, which cover the worm from the head to the tail. On removing carefully these semilunar muscles from the head to the depressed band, a number of minute vesicles are to be seen, (by the aid of a micro-

scope,) filled with a submucous fluid, which issues out upon puncturing them. This cellular or paranchematous apparatus closely embraces the intestinal tube from the head to the depressed band; but from thence to the tail there is merely a fibrous connecting substance, similar to what is generally called cellular membrane. When the muscles are removed from the depressed band to the tail of the worm, an extremely delicate membrane presents itself, analogous to the peritonæum, for it embraces the abdominal viscera, and lines the cavity of the abdomen. This cavity extends from the depressed band, near the middle of the worm, to the tail: it is mostly distended with a transparent fluid, and contains the intestinal tube, and the apparatus subservient to generation. The intestinal canal has already been described. It is generally filled with a dark-brown or greenish-coloured fluid, of the consistence of mucus,—something like the mœconium of infants. If a portion of this tube be macerated for a few days in water, it exhibits distinct tunics, the external of which is a production of the peritonæum. It

is externally covered with filaments, which connect it to the abdominal parietes ; and Dr Hooper conjectures that these may be vessels of nutrition.

These worms infest the small intestines of the human body, and are also found in those of oxen, horses, and pigs. The jejunum and ilium are their most common abodes ; but they frequently ascend into the stomach, from thence into the œsophagus, and make their exit by the mouth and nostrils. It is only after the exhibition of vermifuge medicines that they descend to the lower intestines. They are also reported to have been found in the gall-bladder and ductus communis choledochus. (See Leipsic Commentaries, tom. 14.)

They are generally found in considerable numbers. Dr Hooper knew a girl, eight years old, who voided, *per anum*, upwards of 200 in the course of a week. From 30 to 50 is a very common number, although sometimes only one or two are found. When voided by patients, and exposed to the cold air, they are very feeble, and soon die. By being immediately put

into warm milk and water, however, they may be kept alive for some time, and appear very lively. Their motion is serpentine : the head is always sent forward, by the worm curling itself into circles, and suddenly extending it with considerable force to some distance.

M. Cloquet has distinctly traced nervous filaments traversing the body of this species of worm.*

These worms are quite distinct from the *lumbricus terrestris*, or common earth-worm, with which they have been by some asserted to be synonymous. Their whole conformation, both external and internal, and the kind of motion peculiar to each, are totally different.

This worm was known to, and described by most of the ancient medical writers. It is most generally to be met with in children, although not unfrequent among adults also.

* For a minute anatomical description of this worm, see "Anatomie des Vers Intestinaux, par Jules Cloquet." Paris, 1824.

IV. BOTHRIOCEPHALUS.

PLATE III.

Rudolphi, Entoz. ord. iv. Cestoidea, genus xxv. Bothriocephalus Latus.

Generic Character. Bothriocephalus. Corpus elongatum, depressum, articulatum. Caput subtetragonum, bothriis duobus vel quatuor oppositis.

Specific Character. Capite bothriisque marginalibus oblongis, collo subnullo; articulis anterioribus rugæformibus,—insequentibus plurimis brevibus, subquadratis, latioribus,—ultimis longiusculis.

Bonnet, Mémoires Présentés, t. i. p. 478. tab. i. ii. Tænia à anneaux courts ou à mamelons ombilicaux.

Pallas, Elenchus Zoophyt. p. 408. No 3. t. Grisea, p. 410. No 4. t. Lata.

Bloch, Abhandlung, p. 17. Tænia Lata, der Breite Bandwurm.

Goeze, Eingeweidew, s. 290. fig. 8. t. Lata.

Batsch. Bandw. s. 107. fig. 33. t. Membranea. Der Häutige Bandwurm, s. iii. fig. 51. 2. t. Lata.

Gmelin, Syst. Nat. p. 3065. t. Vulgaris, p. 3067. No 3. t. Lata.

- Joerdens*, Helminth. s. 47. t. iv. fig. 1. 4. t. *Vulgaris*, der Kurzgliedrichte Bandwurm.
- Brera*, Vorlesung, s. 12. tab. i. fig. 3. 7. 13, 14. Der Unbewaffnete Menschliche Bandwurm.
- Encyclopédique Méthodique, art. Vers, p. 116. pl. 41. fig. 5—9. *Tænia Vulgaris*.
- Zeder*, Anheitung, s. 347. No 46. Halysis Lata. S. 348. No. 47. h. Membranacea.
- Hooper*, Memoirs of London Medical Society, vol. v. p. 276. *Tænia Osculis Superficialibus*—the broad Tape Worm.
- Bradly*, a Treatise, p. 84. tab. ii. fig. 3—4. The broad Tape Worm.
- Cuvier*, Regne Animal, p. 44. Le *Tænia*, large.
- De Lamarck*, Anim. sans Vert. t. iii. p. 167. Le Bot de l'Homme.
- Turton's Linné*, iv. p. 49. *Tænia Lata*.
- The *Dutch* call it Lindworm—the *Danes*, Baandworm, Baendelorm—the *Swedes*, Binnike-mask—the *English*, the Tape Worm, Jointed Worm—the *French*, le Ver Plat, *Tænia à épines*, à anneaux courts, &c.

BOTHRIOCEPHALUS LATUS,

THE BROAD TAPE WORM.

THIS animal consists of a head, a chain of articulations, more or less long, and a small rounded tail. It is to be found in the small intestines of the inhabitants of Poland, Russia, Switzerland, and some parts of France; but is not so generally met with in this country as the next species to be described—the *tænia solium*.

In the *bothriocephalus*, or broad tape worm, the articulations are in general broader than long; towards the middle of the body they are in shape an oblong square, have a regular and uniform appearance, and are minutely studded with papillæ, which give them the appearance of shagreen when viewed with a lens, as represented in plate II. fig. 14.; each of the articulations has a smooth elevated fillet or band,

on its upper edge; and in young worms sometimes contract so, that one at first sight would be apt to doubt whether they were joints or not. On the flattened surface of each of these joints, in the middle, and on one side only, is distinctly perceived a small depression, or round opening, called an osculum or mouth: sometimes there is a second small one perceived, a little behind, thus forming a double row of oscula. (See plate II. fig. 13.) Around these small openings the oviducts are seen, situated in the form of a star. Bonnet has remarked proceeding from the oscula a small dart, which he conjectures may be the male organ of generation. The head of the *bothriocephalus* varies (plate II. fig. 9, 10, 11.) somewhat in size and shape from that of the *tænia solium*, to be afterwards more particularly described. It is oblong, and furnished with two, and sometimes four, oval fossets or depressions, in the middle of which is the mouth or opening into the alimentary canal. The tail is generally round, but sometimes bifurcated.

Sometimes there is a neck which connects the head to the first chain of articulation, as in

plate II. fig. 9 and 11., and sometimes it is altogether wanting, as in plate II. fig. 10.; so that this circumstance forms no distinctive mark of this particular species.

This worm is generally rather broader and thinner than the *tænia solium*. The breadth varies from one-eighth to a quarter of an inch. Rudolphi mentions one even an inch in breadth.

It rarely exceeds in length from fifteen to twenty feet; although Goeze asserts that he received one sixty ells in length, and Boerhaave makes mention of one voided from a Russian, thirty yards long. The colour is generally a dusky white, not so perfect a white as the *tænia solium*; and, after remaining some time in spirits of wine, this colour changes to a grey; hence the name of *tænia grisea*, given by Pallas.

Another distinction of this worm is, that it seldom parts with its joints spontaneously; and it has been called on this account by Dionis, *tænia articulis non demittens*.

Three or four, and even more, of these worms have been found in the same person; and they

seem to be peculiar to the inhabitants of the countries already mentioned; and where they prevail the *tænia solium* is not to be found, at least in the same subject.

The *tænia vulgaris* of Pallas is a variety having a double row of oscula.

V. TÆNIA.

PLATE IV. FIG. 1—14.

Rudolphi, Entoz. order iv. Cestoidea, genus xxvi. Tænia Solium.

Generic Character. Tænia. Corpus elongatum, depressum, articulatum; oscula capitis quatuor suctoria.

Specific Character. Capite subhemisphærico, discreto; rostellum obtuso; collo antrorsum increcente, articulisque anticis brevissimis, insequentibus subquadratis, reliquis oblongis, omnibus obtusiusculis; foraminibus marginalibus vage alternis.

Pallas, Elench. Zoophyt. p. 405. No 1. T. Cucurbitina.

Bloch, Abhand. s. 20. 28. Der Kurbiswurm.

Werner, Verm. Intest. p. 18. 49. T. Solium.

Goeze, Eingeweidew, s. 269. tab. xxi. fig. 1. 7. 9. 12.

Gmelin, Syst. Nat. p. 3062. No 1. T. Solium. No. 3. T. Dentata.

Batsch, Bandwürmer, s. 117. fig. 1. 6. 9, &c. Der Kurbisbandwurm.

Carlisle, Transactions of Linnæan Society, vol. ii. p. 247. T. Solium.

- Joerdens*, Helminth. s. 40. tab. iii. fig. 1—7. Der Langg-
liedrichte Bandwurm.
- Brera*, Vorlesung, p. 9. fig. 1. 3. 8. 10, 11. Der Bewaff-
nete Menschliche Bandwurm.
- Encyclopédique Méthodique, art. Vers, p. 115. *Tænia*
Solium.
- Zeder*, Anteiung, p. 359. No 48. Halysis *Solium*.
- Hooper*, Memoirs of Lon. Med. Soc. vol. v. p. 257. *Tænia*
Osculis Marginalibus—the Tape, or Long Joint Worm.
- Bradly*, A Treatise, &c. p. 75. p. iii. fig. 4. *Tænia* Oscu-
lis Marginalibus.
- Cuvier*, Regne Animal, p. 43. *Tænia* à Longs Anneaux.
- Olfers*, De Vegetativis, p. 35. 37. *T. Solium*.
- De Lamarck*, Anim. sans Vert. tom. iii. p. 164. *Tænia*
Cucurbitain.
- Turton's Linné*, iv. p. 43. *Tænia Solium*.

TÆNIA SOLIUM,

THE COMMON TAPE WORM.

THIS worm is found in the small intestines of all the European nations, with the exception of those in whom the *bothriocephalus*, or broad tape worm, is found. It is also common among the Egyptians.

This worm is characterized from the preceding by the more irregular structure and form of the joints which compose its length. They vary much in size and shape in different parts of the same worm, and particularly in being longitudinally wrinkled, in place of papillose, as in the other species. They are generally longer than they are broad, are of an oval, rhomboidal, oblong, or quadrangular shape, and have been often compared in appearance to large cucumber-seeds. The oscula are placed on the margin of the

joints,—sometimes on one side, sometimes on the other,—from whence is seen a communicating canal, leading to the ovaria, placed in an arborescent form, in the middle of each joint.

When the head is minutely examined, five projections are conspicuous on it ; one situated directly in front and in the middle, and the other four backwards, and laterally. (Plate IV. fig. 2, 3.) The anterior projection is the proboscis of the animal. When viewed with a microscope, a projecting margin is perceptible, surrounding an excavation, of a striated appearance, like a star. In the centre of this is an orifice or mouth, leading to the alimentary canal, to be afterwards described. The stellated appearance is composed of two series of radii, (plate IV. fig. 2.) with little bulbs or vesicles, corresponding to the number of fibrils with which the margin is beset, and which gives it a lacinated appearance. Passing backwards, the neck of the proboscis presents itself, which, towards the base, becomes broader and somewhat flattened. The basis is quadrangular, and has a hollow protruding tubercle or osculum at each angle. It then be-

comes considerably flattened, and forms a thick margin, which receives the superior or adjacent margin of the neck. (Plate IV. fig. 1.)

These four apertures which surround the head are of a dark appearance, from their containing a blackish fluid. They have been called the eyes by some, the organs of generation by others; but the most probable supposition is, that they are suckers, by which the worm adheres to the coats of the intestines, and fixes itself in its position.

The neck of the *tænia* is flattened or depressed, and varies in length; the articulations next to the neck are generally small and short, and become much longer and broader towards the tail. When the surface of a joint is viewed by a microscope, after it has been wiped with a sponge, it appears rough and villous, but it soon becomes covered with a white tenacious liquid, which exudes through the pores of the skin. If this liquid be again wiped off, during the life of the animal, it is quickly renewed. Hence it is conjectured, that the villi may be exhaling vessels. On the margin of each joint, as has al-

ready been observed, is situated an osculum, or small opening, but only on one side; sometimes there are two of these oscula found; but Rudolphi thinks rarely or never more. In general, the next joint has its osculum on the opposite side; so that they thus change alternately. This order, however, is seldom preserved throughout the whole course of the worm, for they are sometimes on the same side for several joints together; but they never are situated on the flattened surface, as in the *bothriocephalus latus*, which is one of the principal distinctive marks between the two species.

The *tænia* seems to be furnished with but one external skin, which is very porous and elastic, and which most probably is endowed with a nervous power. *Tænia*, therefore, have no cuticle.

The head is composed, like the other parts of the worm, of cutis and muscular fibres. The fibres, however, are not in any regular order, but appear to run in every direction, and are united together by a connecting cellular membrane. The head contains also within it the

commencement of the alimentary canal, which originates from the mouth by a simple tube or œsophagus, that divides into two near the basis of the proboscis. Thesetwo branches of thealimentary tube proceed from the head, near each margin of the worm, to the other extremity. Through this canal the chyle is conveyed to every part of the animal for its nourishment and increase.

Dr Bremser has a specimen of a small worm where there is only one single canal, which runs down the middle of the animal. When the external skin is removed from the joints, the muscles are seen, of a white colour, very much resembling coagulable lymph, and are disposed in two orders, evident to the naked eye. There are first the *longitudinal*, or external muscles, which are of a strong firm texture, running parallel to each other in the direction of the worm, being firmly attached to a kind of ligamentous band, and placed along the articulatory receiving margin of each joint. The *transverse* muscles are situated under the longitudinal, and across the joint transversely, from one extremity to the other.

When the longitudinal muscles contract, the length of the joint is diminished, and drawn forward. The transverse act by diminishing the breadth of the joint, and sometimes render it almost round.

Each articulation, or joint, is furnished internally with two distinct kinds of vessels,—the alimentary tube and the ovaria. The rest of the joint is composed of a connecting cellular substance.

The alimentary canals, as has been mentioned, run along at each side of the body ; and there are also transverse canals, which are sent off from each articulatory receiving margin on both sides ; so that the contents of one tube are easily communicated across to the other. These canals are of a whitish appearance, and can only be seen distinctly after they have been injected with a fine size, made from a solution of harts-horn shavings, mixed with vermilion, and strained through a gauze sieve. (See plate IV. fig. 7.)

Each individual joint has a vascular structure, situated between the longitudinal canals, occupying the middle of the worm. It is always

disposed in an arborescent form, and is called the *arborescent ovaria*, from its resemblance to a tree, being composed of a middle canal, spreading out into various lateral branches. There is a communication between this arrangement of vessels and the osculum on the margin, by means of an intermediate canal, which, in some joints, is filled with a brown matter. The ovaria, which contain the ovula or eggs, are generally filled with an opaque fluid, very like chyle. In some joints, and especially those near the tail, which are generally more transparent than the rest, this appearance is evident to the naked eye, especially if the joint be put on blue or dark-coloured paper.

With regard to the connexion of the joints, it may be observed, that the first articulation is received into the basis of the neck, the next joint is then received into the basis of the preceding, and so on throughout the whole length of the worm. Thus the inferior margin of the joint towards the tail is called the receiving articulatory margin, to distinguish it from the other which is received. The receiving articu-

latory margin is supplied with a ligamentous band, to which the longitudinal muscles are attached, which firmly embraces the next joint. This margin may be distinguished from the other by its being larger, and by its being fringed, whereas the other is plain, and somewhat rounded. The motion of *tæniæ* is undulatory. The first joint towards the head contracts, the succeeding ones follow successively, and the worm is at length drawn considerably forwards, exactly in the manner that the earth-worm is seen to move, but not near so rapidly. By this motion, the food taken in at the mouth of the worm is very soon conveyed all along the alimentary canal.

The colour of the *tænia solium* is generally of a pale white, but it sometimes varies to a darker hue. The breadth of the worm varies much in the different parts throughout its length; towards the head it is sometimes not more than one-thirtieth part of an inch, but it gradually increases to one-eighth and one-fourth of an inch; but, from the contraction and extension of its surface, these measurements must be very inaccu-

rate. The thickness also varies very much; sometimes it is very thin and transparent, at other times it is found thick and opaque. The head is in general very small, but sometimes so large as to be distinctly seen without the aid of a microscope.

This species of worm is very seldom or indeed never voided entire, and therefore the various accounts of its great length must often be very erroneous. Nothing can be more so than the method of estimating its length by the number of joints voided; for, as will be mentioned afterwards, this worm has the power of continually throwing off joints, and multiplying or producing others to supply their place.

Tæniæ, of twenty-four and thirty feet, are not rare, and this latter may be estimated as the extreme length; for, as they only inhabit the small intestines, which are usually about thirty feet in length, it is impossible that they can find room in these for the enormous extension which some authors have noticed.

Reinlin, in his works, mentions *tæniæ* from forty to fifty ells in length.

Hufeland relates the case of a child, of six months old, who passed, from time to time, thirty yards of this worm, without the least effect on its health; and Robin found in a subject a worm which extended the whole length of the intestines, from the pylorus, or lower orifice of the stomach, to within six inches of the anus.

This worm was known to the ancient medical writers, but under two distinct names,—the *lumbricus lata* and *tænia solium*; and in all probability they confounded the two species, *bothriocephalus* and *tænia*, together.

It was long believed, that one worm only was to be found in the same person, and hence the origin of the name *tænia solium*. This opinion, however, has been proved to be erroneous. De Haën saw eighteen expelled from a female of thirty years of age; and Dr Bremser has frequently seen two or three passed from the same individual.

Dionis, in his treatise on *tænia*, has called this species *tænia articulos demittens*, in consequence of the frequency of its parting with its joints. And the Arabian physicians, observing

these detached portions come away alive, and not thinking it possible they could be joints of another worm, believed they were a distinct species, and described them accordingly.

Blumenbach maintained, that the articulations when separated became distinct animals; and Mr Carlisle, in his treatise, holds the same opinion.

Linnæus arranges them amongst the polypi, and denies that they have a head, which he often searched for, but could not find. Some believe the lateral oscula to be the mouths by which they take in their food, and, at the same time, consider them as excretory vessels.

The formation of new joints in the *tænia* may be accounted for in three ways; 1st, By forming new articulations at the tail; 2dly, Between the articulations themselves the old ones may separate somewhat, and the new-formed joints gradually enlarge; and, 3dly, From the inferior extremity of the neck, either by a formation of new joints directly from the head, or by the enlargement and elongation of the small articulations there existing.

Dr Bremser is of opinion, that this latter is the most probable way ;—that the *tænia* is at first formed perfect and complete, though of small size ; that gradually, as the joints nearest the tail enlarge, become impregnated with eggs, and these eggs having arrived at maturity are expelled, the joints drop off, and those nearest the neck expand, in their turn become impregnated, and are thrown off likewise. It is quite uncertain what period of time they take to accomplish this ; but in all probability *tæniæ* live for several years in the intestines.

It is the most probable conjecture, that these worms are hermaphrodite. The organs of generation have never been distinctly seen, although the marginal oscula are doubtless subservient to this process.

Mr Carlisle remarks, “ In a *tænia*, which I obtained before it was dead, I observed at one part, where it had formed a knot upon itself, that two pairs of these oscula were in contact with each other, and were agglutinated together by a viscid mucus. I was not at that time aware of the possible nature of this connexion,

and neglected preserving them in that state; I now suspect, however, that they were in the act of copulation, and that a mutual influence takes place previously to the formation of ova."

The *tænia dentata* has been mentioned by some writers as a variety of this species.

OF WORMS WHICH ARE FOUND IN THE OTHER
STRUCTURES AND CAVITIES OF THE BODY.

VI. FILARIA.

PLATE V. Fig. 1.

Rudolphi, Entoz. order 1. genus i. *Filaria Medinensis*.

Generic Character. Corpus teres, elasticum, subequale, elongatum; os orbiculare; genitale masculum spiculum, simplex.

Specific Character. F. longissima capite attenuato; cauda maris subulata, inflexa,—feminæ semitereti, acutiuscula, incurva.

Gmelin, Syst. Nat. p. 5039. No 1. *Filaria Medinensis*.

Joerdens, Helminth. p. 94. No 2. tab. i. fig. 1. Der Hautwurm, Fil. Med.

Encyclopédique Méthodique, art. Vers, p. 89. Gordius Medinensis.

Brera, Memoriae, p. 289. spec. 2. Fil. Med.

Bradly, A Treatise, p. 103. The Guinea Worm.

Cuvier, Regne Animal, t. iv. p. 30. Le Ver de Medine ou de Guinée.

Sloane, Jamaica, ii. p. 190. tab. 233. fig. 1.

De Lamarck, Anim. sans Vert. t. iii. p. 217. Le Filaire de Medine.

Dr Blainville, Dictionn. des Sciences Nat. tom. xvii. p. 5. Fil. de Medin.

Turton's Linné, iv. p. 20. Filaria Medinensis.

The *Δεξακοντιον* of the *Greeks*.

The *Germans* call it Fadenwurm—the *French*, Dragonneau—the *Hindoos*, Nároo, Néeria, and Néruah.

FILARIA MEDINENSIS,

THE GUINEA WORM.

THE Guinea worm was known at a very early period, and the first mention of it is by Agatharchides, born at Cneidos, four or five hundred years before Christ. Plutarch also describes it very accurately.

The form of the worm is extremely simple, as is seen from the representation, plate V. fig. 1. It is of a white colour, of the size of a violin-string, and of equal thickness at both ends, and throughout its length, except, perhaps, that it tapers slightly towards the tail, which is a little bent. Its head has a small trunk, called a beard by the Persians, and which, when examined by a microscope, seems to be furnished with small hairs. Some think they have discovered a head at both ends; while Bremser is of opinion that

the inferior end may be furnished with generative organs. Authors are not well agreed about its length. Some affirm that they have seen it from three to ten and twenty feet long. Barère states, that it is found six ells in length, and Dampier five or six yards; Dubois saw one a yard long, and of the thickness of a violin-string; while Heath, on the contrary, among a number of cases which came under his notice, found few of them longer than nine inches, and the very largest forty-two inches.

This worm is only to be found among the inhabitants of the torrid zone; in Arabia, in the Persian Gulf, on the shores of the Caspian Sea, in Egypt, Abyssinia, and in Guinea. Europeans going to these countries are as liable to be affected with it as the natives. It is not found in America, except among the negroes who come from Africa.

The situation where this worm is found is in the cellular tissues below the integuments, most frequently of the superior and inferior extremities, twisting itself about the malleoli; but it may be found also in all the other parts of the

body,—as the scrotum, the testicles, and even the external membranes of the eyelids. It is generally placed superficially, and may easily be felt; but sometimes it is deep sunk among the interstices of the different muscles. The place it occupies is generally small, being coiled up circularly. They are often found to the number of twenty and even fifty in the same person. Various opinions have been advanced regarding the formation of this worm. Some have supposed it only a portion of the cellular substance; while the general belief is, that it is an animal endowed with life. Some again regard it as the larva of an insect which has deposited its eggs in the body. Others have confounded it with the *gordius aquaticus*, or water hair-worm, which is found in stagnant water, and suppose that this latter insect when young penetrates into the skin during bathing, or is swallowed along with water, either in the young state or as an egg.

Rudolphi, Bremser, and others, reckon it an animal *sui generis*; and there is no doubt but it is a distinct species.

Many writers have endeavoured to account for its production from the bad quality of the water. Bernier, Bruce, Dampier, &c. are of this opinion ; while some think that it is contagious.

The symptoms attending the existence of this worm in the body are—intolerable itching in the part, with a tumour like a boil, and sometimes, especially when the tumour is about to suppurate, slight fever, nausea, and general disorder of the system. It may, however, be in the body, without giving any of these indications of its existence, for six and even twelve months.

Some writers are of opinion, that as long as the animal is alive, it gives no trouble or uneasiness, and that the suppuration and pain only commence after it is dead.

Various remedies have been applied for it, such as poultices of onions, of aloes, mercurial frictions, volatile liniment, bleeding, and purging. When the suppuration has commenced, the best mode of promoting it and alleviating pain, is the frequent applications of emollients, poultices, and warm fomentations. The

tumour generally opens of itself, or it may be opened by the slight puncture of a lancet. The head of the worm then presents itself, which is to be cautiously laid hold of, and gently pulled, day after day, till it is completely abstracted. No force is to be used, and the greatest care is to be taken not to break the animal; as we are informed by some writers, that the part remaining under the skin grows with redoubled vigour, and occasions often a fatal inflammation. The best method is to coil it up, as it is gradually pulled out, on a piece of cloth rolled up, a piece of plastic bougie, or small bit of wood; and, to secure it, a small piece of silk is to be tied round its head. The muscles in the vicinity are to be relaxed as much as possible during the process, to favour the extraction of the worm.

When there is fever, the use of purgatives, rest, and cool air, will be highly advantageous.

VII. HAMULARIA.

PLATE V. FIG. 2—3.

Rudolphi, Entoz. ord. 1. genus i. spec. 20. *Filaria* *Homini* *Bronchialis*.

Bremser, *Hamularia* *Subcompressa*.

Generic Character. Corpus teres, elasticum, subequale, elongatum; os orbiculare; genitale masculinum spiculum, simplex.

Specific Character. *Subcompressa*, antice attenuata.

Treutler, *Auctuar.* p. 10. tab. ii. fig. 3. 7. *Ham. Lymphatica*.

Joerdens, *Helminthol.* p. 31. tab. vi. fig. 9—12. *Ham. Lymph.*

Zeder, *Naturgesch.* s. 45. *Tentacularia* *Subcompressa*.

Brera, *Memorie*, p. 225. tab. iv. fig. 1. 3. *Amularia* *Linfatica*.

De Lamarck, *Anim. sans Vert.* t. iii. p. 216. *L'Hamulaire* de l'Homme.

HAMULARIA SUBCOMPRESSA.

TREUTLER, in 1790, in dissecting the body of a patient who had died of phthisis pulmonalis and dropsy, found in the bronchial glands, which were in this case enlarged beyond their usual size, two worms, the one somewhat longer than the other. These animals were oblong, round, a little compressed on both sides, dark-brown, studded with black spots, tapering slightly towards the anterior extremity, a little transparent towards the tail. The two extremities bent or curved up a little after the death of the animal. The head terminated in an obtuse point, and was furnished with two prominent hooks or projections ; except these two crochets, no other traces of organs were perceptible. Plate V. fig. 2. is a little magnified, fig. 3. more magnified.

VIII. STRONGYLUS.

PLATE V. FIG. 4.

Rudolphi, Entoz. order 1. genus viii. sp. 3. Strongylus Gigas.

Generic Character. Corpus teres, elasticum, utrinque attenuatum; os orbiculare vel angulatum; apex caudæ masculæ terminatus bursa penem emittente.

Specific Character. Capite obtuso; ore papillis planiusculis sex cincto; bursa maris truncata, integra; cauda feminæ truncata.

Cuvier, Regne Animal, t. iv. p. 34. Le Strongle Géant.

De Lamarck, Anim. sans Vert. t. iii. p. 202. Le Strongle des Reins.

STRONGYLUS GIGAS,

THE LARGE STRONGYLE.

THIS worm is found in the kidneys, and perhaps in the muscular substance which surrounds them. Rudolphi found them in length from five inches to three feet, and in thickness from two to six lines.

The male is smaller than the female, (see plate V. fig. 4.) and tapers towards the two extremities. The mouth is circular, and provided with six small papillæ. The body is composed of annular rings, presenting many longitudinal depressions. The tail (plate V. fig. 4. a.) forms at its extremity an organ, in some sort like a penis, but very minute. In some species it is entire,—in this, bifurcated.

The female is larger. The end of its tail is

straight and obtuse, and there is seen in this place a longitudinal anus. The entrance of the vagina is distant one or more inches from the extremity of the tail, according to the length of the worm. (Plate V. fig. 7.)

Otto thinks he observed a nervous system in the *strongylus*.

This worm is found in cats, dogs, the wolf, and in oxen and horses.

They have been passed frequently, *per urethram*, after symptoms of great irritation about the region of the kidneys and bladder.

Hugo Grotius reports, that there were found in the kidneys of the Grand Duke Ernest of Austria, who died in 1595, a small stone and also a living worm.

Ruysch, who often observed the *strongylus* in dogs, found once a worm of this species in the kidney of a man.

Blasius met with two worms, of a red colour, in the kidneys of a peasant, each a yard in length. And Rhodius relates the case of a patient infected with malignant fever, who

passed with his urine a living worm, of a round form, and a foot in length.*

Rudolphi mentions, in his Synopsis, a species of the *Spiroptera*, (order 1. genus vi. Sp. Dubiæ. 23. *Spiroptera hominis*) which has been found in the human bladder.

* See also Medico-Chirurgical Transactions of London, vol. ii. p. 385. Lawrence's case of a woman who voided worms by the urethra.

IX. DISTOMA.

PLATE VI. FIG. 1, 2.

Rudolphi, Entoz. Order iii. Trematoda, genus xv.
Distoma Hepaticum.

Generic Character. Corpus molle, teretiusculum vel depressum. Porus anticus solitarius.

Specific Character. Obovatum, planum; collo subconico, brevissimo; poris orbicularibus ventrali majore.

Gmelin, Syst. Nat. p. 3085. No 2. Fasciola Humana.

Joerdens, Helminth. s. 64. t. vii. fig. 13, 14. Der Leberblattwurm, Fasciola Hepatica.

Brera, Memorie, p. 92. 41. fig. 22, 3. Fasciola Epatica.

Cuvier, R. A. t. iv. p. 41. Douve du Foie.

De Lamarck, A. s. V. t. iii. p. 182. Fasciole Hepatique.

Called by the *Germans*, Leberdoppelloch, der Leberwurm, Schafegel, die Egelschnecke—*Dutch*, Leverwurm Botten—*Danes*, Faareflynder, Ikte, Igler, Iler Souaegler—*Swedes*, Lever Mask—*English*, the Liver Fluke—*Italians*, Bisciuola—*Spaniards*, Caracolillos, Serillas, Pujarillos.

DISTOMA HEPATICUM,

THE LIVER FLUKE.

THESE worms are found in the gall-bladder, and Dr Bremser supposes also in the human liver. They are found likewise in sheep, horses, oxen, &c.

They are in length from one to four lines, and one-half to one line in breadth; shaped somewhat like the point of a lancet, obtuse at their two extremities.

The anterior opening is directed obliquely inwards. The neck is rounded, and of a dark-brown colour. The posterior opening of the belly is slightly prominent.

A little lower on the belly are seen spots of an opaque dingy white, and a packet of tubes or vessels of a brownish colour, probably the

oviducts ; the vessels which run along both sides most likely forming the alimentary tubes.

M. Otto thought he observed in these animals a nervous system.

Pallas mentions, that he found these worms situated in the hepatic duct of a female subject which he dissected in the anatomical amphitheatre at Berlin.

Chabert, by the administration of his empyreumatic oil, caused the discharge of an innumerable quantity of these animals from a girl of twelve years of age ; and Bucholz found a great quantity of them in the gall-bladder of a slave who died of putrid fever.

Sheep are peculiarly liable to be affected by this worm,—either a consequence or the cause of diseased livers in them. A liberal use of salt and a change to dry pasture will be found efficacious. Bremser also proposes the empyreumatic oil of Chabert to be given in this disease.

X. POLYSTOMA.

PLATE VI. FIG. 3—5.

Rudolphi, Entoz. order iii. genus xviii. Polystoma Pinguicola.

Generic Character. Corpus teretiusculum vel depressum ; pori sex antici, ventralis et posticus solitarii.

Specific Character. Depressum, oblongum, antice truncatum,—postice acuminatum ; poris sex anticis lunatim positis.

Treutler, Auctuar. p. 19, 20. tab. iii. fig. 7. 11. Hexathyridum Pinguicola.

Joerdens, Helminth. p. 66. tab. i. fig. 3. 5. Der Fettblattwurm.

Zeder, Naturgeschichte, p. 230. No 2. Polystom. Pinguicola.

Brera, Memorie, p. 100. tab. i. fig. 28. Exatiridio Pinguicola.

De Lamarck, Anim. sans Vert. t. iii. p. 174. La Lingua-tule des Ovaires.

POLYSTOMA PINGUICOLA.

THIS species was discovered by Treutler, in dissecting a female twenty years of age, who died in consequence of a protracted delivery.

He discovered a tumour among the fat which covered the ovary, fixed in the cellular substance. It was of the size of a nut, of a red colour, and contained inside a worm, which is represented in plate VI. fig. 3.; fig. 4. suckers on the side; fig. 5. organs.

XI. CYSTICERCUS.

PLATE VI. FIG. 6—8.

Rudolphi, Entoz. order v. Cystica, genus xxviii. *Cysticercus Cellulosæ*.

Generic Character. (Vesica externa simplex, continens Entozoon solitarium, cujus).—corpus teretiusculum vel depressum, abiens in vesicam caudalem; caput (teniæ armatæ) osculis suctoriis quatuor, rostelloque uncinato, instructum.

Specific Character. Capite tetragono; rostello terete, uncinato; collo brevissimo; corpore cylindrico longiore, vesica caudali, elliptica transversa.

Gmelin, Syst. Nat. p. 3059. No 6. *Tænia Cellulosæ*—*Tænia Finna*.

Joerdens, Helminth. s. 57. t. v. fig. 12. 16. *Tænia Muscularis seu Finna Humana der Muskelblasenwurm*, &c.

Brera, Vorlesung, s. 14. tab. ii. p. 89. *Blasenwurm*—*Fischiosoma Globosa*, &c.

Zeder, Anleitung, p. 407. No 2. *Cystic. Finna*.

De Lamarck, An. sans Vert. t. iii. p. 154. *Hydatide Lancéolée*.

CYSTICERCUS CELLULOSÆ.

THESE animals are found in the cellular tissues of the muscles and in the brain, especially in the choroid plexus, where they have been met with in considerable numbers.

They are not very often found in the human body, but are frequent among hogs, and in the ape tribe sometimes.

Plate VI. fig. 6. represents a portion of muscle, with the capsules containing the worms attached. They seem to have a somewhat similar formation to the nut-galls on the oak; and the capsule and its contents would appear to be formed by the irritation of the contained worm. The interior of the capsule is smooth, and contains a little liquid. A small spot to be seen, whiter than the rest, is the place where the head and body of the worm protrudes and retracts itself within the vesicle, *vide* fig. 7.

XII. ECHINOCOCCUS.

PLATE VI. FIG. 9—11.

Rudolphi, Entoz. order v. genus xxx. Echinococcus Hominis.

Generic Character. Vesica externa simplex vel duplex, cujus superficiei externæ insident entozoa plurima, arenulam mentientia, quorum—

Corpus obovatum; caput (tæniæ armatæ) uncinorum corona et osculis suctoriis instructum.

Joerdens, Helminth. s. 62. tab. vii. fig. 21. 23. Der Menschenvielkopf, Polycephalus Hominis.

Zeder, Anleitung, s. 431. No 2. t. iv. fig. 7, 8. Polyceph. Hominis.

Brera, Memorie, p. 149. Fischiosomo Policefalo—Fina Idatoide.

De Lamarck, An. sans Vert. t. iii. p. 157. L'Echinocoque de l'Homme.

ECHINOCOCCUS,

THE HYDATID.

THIS and the two preceding species are known under the general name of *hydatids*; which appellation, according to Bremser, is proper to every vesicle, in whatever part of the body it is found, which contains a limpid fluid like water, or even of a thicker consistence, which is surrounded and enclosed by a capsule, detached from and not forming a portion of any other membrane.

The *hydatid* is a spherical body, consisting of one and sometimes of two membranes, enclosing a fluid most commonly limpid and transparent, but which sometimes is found of a tough, hard, and opaque consistence. On the inner coat of the membrane are attached a number of small granular bodies, which are called the *echinococci*.

Rudolphi divides the *hydatids* into *viventes*

and *non-viventes*. He denies the vitality of the *hydatid*, properly so called, and supposes that the small granulous bodies, or echinococci only, which cover the internal surface of the membrane, are endowed with life. Bremser, on the other hand, is of opinion, that the vesicle is a distinct animal, and that the small granulations on its internal surface are *hydatids* in miniature, which gradually enlarging, and, detaching themselves from the parent covering, become in their turn independent animals.

Sir E. Home is also of opinion, that *hydatids* are endowed with life, and that they are the simplest of all animals, being composed entirely of one large stomach.

Hydatids have been found in great numbers in all the textures and cavities of the human body, with the exception of the intestinal canal. Morgagni has found them in the brain and spinal marrow. Sœmmering discovered several in the pituitary gland; and Morrach found in the right ventricle of the brain of a girl, who died with all the symptoms of apoplexy, an *hydatid* three inches long and two in breadth.

OF PSEUDOHELMINTHES,

OR DOUBTFUL SPECIES.

Of these Worms Bremser enumerates seven species, of which we can only here give the names:—

I. Ditrachyceros Rudis.	Plate VI. fig. 12.
II. Ascaris Stephanostoma.	— 13.
III. Ascaris Conosoma.	— 14.
IV. Cercosoma.	— 15.
V. Hexathyridium Venarum.	— 16.
VI. Diacanthos Polycephalus.	— 17.
VII. Hydrometra Hydatica.	— 18.

IN the Museum of Dr Mackintosh of Edinburgh there are three worms which were voided from the intestines of the human body, and which appear to have all the characteristics of a distinct species of *oxyuris*. They were discovered by Captain Brown; and a description, with references to drawings taken from nature, is here subjoined.

OXYURIS ANGULATA.

PLATE V. FIG. 6—15.

Specific Character. Capite obtuso ; corpore incurvato, crasso, cylindrico, undulato ; striato transverse ; cauda recta, attenuata, subulata.

THE male of this species is about two inches in length, and of a pale horn-colour. The body is one inch and an eighth in length, and an eighth in diameter, is bent in the form of a very obtuse angle, is thick, cylindrical, undulated, minutely striated transversely, and gradually tapers towards the head, which is somewhat obtuse, and terminated by a thick elevated ring, from the centre of which rises a truncated conical proboscis, with an extremely small punctiform mouth in its centre ; the tail is about six-eighths of an inch in length, and bodkin-shaped, tapering very abruptly, is perfectly smooth, and about

one-third the thickness of the body. The cuticle of this worm is so extremely pellucid, that the œsophagus and alimentary canal can be seen distinctly through it. The alimentary canal, embedded in a dark substance, which, when viewed through a microscope, presents the appearance of minute globules, extends throughout the body, and terminates at the commencement of the tail; but the spermatic vessels which surround it, through its whole length, stretch an eighth of an inch farther down, and are folded back. Plate V. fig. 6. size of nature; fig. 7. considerably magnified; fig. 8. the head very much magnified; fig. 9. a transverse section of the head do.; 10. tail, do.

In the female, the body is thicker and of a much darker horn-colour, and the alimentary canal extends to the point of the tail, surrounded by the oviducts. The head consists of a cylindrical process, about a third smaller than the body, surrounded by a thick ring, within which is a large circular depression, with a distinct punctiform mouth in its centre. The tail is much thicker than that of the male at its commence-

ment ; it tapers more abruptly, and terminates in an acute point. The striæ on the body are much finer than those of the male. Plate V. fig. 11. size of nature ; fig. 12. do. considerably magnified ; fig. 13. head very much magnified ; 14. a transverse section of the head, do. ; 15. tail, do.

Besides the difference in the heads of the sexes of this species, and other distinctive characters, the head in the male turns from the tail, whereas that of the female turns towards it.

The only worm we are acquainted with, which approaches in shape to this species, is the *oxyuris curvula*, figured in the illustrations of Rudolphi's Entozoologium, published at Vienna by Bremser, plate I. fig. 1—3. which inhabits the intestines of the horse ; but this differs much from those just described, not only in the form of the head, but also of the body and tail.

OF THE SYMPTOMS ATTENDING THE PRESENCE
OF WORMS.

THE most general symptoms observable in those affected with worms are the following:—The appearance of the countenance is changed, it is generally very pale, or of a leaden colour, with a red circumscribed spot in one or both cheeks. The eyes lose their brilliancy, the pupil is enlarged, and a blue rim is perceivable round the under-eyelid. The nose is swelled, and very generally the upper-lip is somewhat tumified, and there is a continual itching and irritation in both these. Sometimes, too, there is a bleeding from the nose. There is also headache, throbbing in the ears, a foul tongue, more saliva than natural in the mouth, and the breath is very fetid, especially in the morning. The appetite is variable; sometimes it is quite gone, and at

other times it is voracious, with a continual gnawing sensation at the stomach. There is also nausea, and a desire to vomit; when this takes place the fluid ejected is limpid like water. There are often violent gripings, and these are principally felt about the umbilical region. The alvine excretions are glairy, and sometimes tinged with blood. The urine is turbid, and, after it has deposited a sediment, it has the appearance of milk and water. The belly too is hard, and has a feel like a drum. There is a general emaciation of the body; the sleep is troubled, accompanied by grinding of the teeth. The patient is generally lazy and indolent, sometimes in good and sometimes in irritable temper. Blindness, deafness, delirium, even apoplectic and epileptic fits, have been known to have their origin from worms. The last and most decisive symptom observed is, that in the matter vomited, but more generally in the alvine excretions, entire worms or portions of them are perceived.

It must be remarked, that all the above symptoms are not always found in the same in-

dividual; nor do any of them, except the last, exclusively indicate the presence of worms. One or more of these symptoms may be indications of the existence of several other diseases, as water of the head and some others; but when these symptoms occur, and cannot be attributed to any other cause, the strong presumption is, that this cause is worms. At the same time, it may be mentioned, that worms sometimes exist, and that in considerable quantities, without causing any inconvenience or any bad symptoms whatever.

On this account, Goeze, and some other writers, have advanced a theory, that worms may not only be harmless, but even very useful in the alimentary canal, and may serve the purpose of consuming the nutritious matter when it exists in excess there; may serve by their irritation as a stimulus to slow and torpid bowels; and do a variety of other fanciful good offices. But, granting that in any one single case they are productive of good, which is extremely doubtful, still experience daily demonstrates that they are productive of continual

and extensive mischief; and that, like all other diseases, and all other evils which are incident to man, they are to be combated and warded off by the wisdom and foresight with which he is endowed for that purpose.

Many maladies are supposed to be caused by worms, such as apoplexy, epilepsy, St Vitus's dance, and a variety of others. These may and sometimes have been undoubtedly found to have their origin in the irritation caused by these animals; but the notion must not be carried too far. If, during any of these diseases, worms should be voided, or joints or small portions of worms, it does not follow that these have been the original cause of the complaint; but they may have previously existed in the intestines, and, from the altered state of the body, or the exhibition of medicines, may have been expelled. It is in this way that the notion of worm epidemics and fevers must have originated. Fever, when it seizes a patient, generally proves the death of the worms contained in the body; and this circumstance occurring in those in whom worms had previously existed, had very

naturally given rise to the erroneous conclusion, that these worms were the cause and not the effect of the fever.

Sometimes worms in the intestines have been the cause of singular idiosyncrasies in some individuals. Delisle mentions the case of a young person who passed, during a whole year, spontaneously *ascarides* and morsels of *tæniæ*; in the course of which time he could not endure to hear music, vocal or instrumental.

Desarneaux, on the other hand, mentions a young patient who had horrible convulsions, which continued with him till his death;—he was also affected with worms. By accident, during one of his convulsive fits, he heard music, which immediately cured him.

There have been frequent cases of temporary loss of vision, or *amourosis*, cured by the evacuation of worms. The following case of death, in all probability caused by worms, is related by Campedon:—

A male patient died after suffering a violent colick for 24 hours. On opening the body, the cœcum and part of the colon were found filled

and completely distended by a mass of *ascarides*. No less than 367 of these worms were found, each six inches in length. The intestines had become inflamed, and had passed into a gangrenous state.

M. Serres relates the case of a child, three years old, who was bit by an angry dog. Six months afterwards all the symptoms of hydrophobia showed themselves, and she died soon after. An inspection of the body showed that the brain, the spinal marrow, the lungs, and larynx, were in a healthy state; the stomach contained nothing extraordinary, but the small intestines were filled with *ascarides*, which completely obstructed their cavity. The number of these animals was very considerable; and M. Serres was disposed to attribute the death of this child to the worms, and not to hydrophobia.

Dr Bremser relates the case of an epileptic patient whom he completely cured by the use of anthelminthicks:—

In 1816 he saw a young person of nine years of age, who, for two years, had suffered from most violent convulsive fits of epilepsy; during

this time he was observed to pass a small piece of *tænia*. Dr B. fortunately produced the evacuation of the whole animal, and from that time the convulsive fits ceased.

There has been a good deal of argumentative discussion among writers, whether or not worms perforate the coats of the stomach and intestines. Rudolphi and Bremser are of opinion that they do not, for this reason, that they have not organs capable of perforating the tough coats of the bowels, notwithstanding many cases have been related where it is asserted that they have penetrated through these. M. Blainville, in his notes in the Appendix of Dr Bremser's work, is of opinion, that these worms may make their way through the coats of the intestines; and in this he says he is supported by the opinions of other French helminthologists.

METHOD OF CURE.

Two principal objects are to be attended to in the treatment of worm-affections,—the destruction and expulsion of the worms, and the correction of that particular state of the general system, and especially the intestinal canal, which has been the cause of their formation.

A great variety of remedies have been employed for the destruction of worms ; and they may be divided into those which act mechanically—those which have a specific power—and those which act by their purgative effects.

Those medicines which are given with a view of destroying intestinal worms by their mechanical action are of very doubtful operation, and in all probability owe the whole of their good effects to the powerful purgatives with which they are always either conjoined or immediately

followed. Even the cowhage, (*stizolobium*) a remedy so much recommended by Chamberlaine, and which for a considerable time was in much vogue for the cure of *tænia*, though calculated to act as the most powerful mechanical agent, from the peculiarly sharp, penetrating, and minute spiculi of which the down of the pods is composed, has never been found effectual, unless purgatives are used at the same time.

The mechanical medicines which have been most generally used are zinc, tin-filings, iron-filings, cowhage, charcoal, &c.

Of the medicines which have a specific effect in causing the death of these worms, there is also a considerable number which may be enumerated. The most simple is cold or iced water, which quickly destroys these animals; but, from the impossibility of its being applied in this state, except in the form of enema, it is of very limited and uncertain use. Valerian is a common anthelminthick; as also onions, garlic, assafoetida, camphor, artemisia santonica, and most of the bitter class of herbs; spigelia anthelmintica, polypodium flex mas, or the roots

of the male fern, prussic acid, the various oils, both animal and vegetable, more especially petroleum, oil of cajeput, oil of turpentine, and empyreumatic oil.

The purgative medicines which have been employed are the neutral salts, jalap, scammony, aloes, the preparations of mercury, castor-oil, &c.

The various mineral waters, too, are more or less anthelminthick, and are useful not only as a means of expelling the worms, but of improving and strengthening the alimentary canal, and the whole system in general.

OF THE CURE OF THE MAW, OR THREAD WORM,
(*OXYURIS VERMICULARIS*,) AND LONG THREAD
WORM, (*TRICHOCEPHALUS DISPAR*).

THESE two species of worms are found in the large intestines, or lowest part of the intestinal canal. They may often exist in great numbers without causing any inconvenience, or indeed without their presence being ascertained; most generally, however, they cause considerable irritation, and sometimes the heat and pain about the anus is excessive and intolerable, especially at night after a journey, or any violent exercise during the day, by which the body has been heated. They are most common in children; and in these, especially when very young, cause fits and convulsions. Those medicines given by the mouth, with a view to their destruction, generally, in the course of the long passage

through the intestines, lose their peculiar virtues, and become of little use; injections, therefore, are most to be depended on. Aloes, however, are known to have the property of acting particularly on the rectum and cœcum, and of passing through the other small intestines little changed; from two, three, to six grains of aloes, given in a pill or powder every morning, often destroys these worms in considerable numbers.

Dr Bremser's method of cure for these small thread worms is as follows:—

For several mornings he gives a tea-spoonful of the electuary marked No 1., with the intention of forcing the worms downwards into the rectum; this is followed by a dose of jalap, or one of the powders marked No 3.; and, after this, two injections of the enema marked No 2. are exhibited. This routine of treatment is to be continued for some time, till a cure is effected. An injection of any of the common oils, he has also found, relieves the extreme irritation, and also destroys the worms. In obstinate cases he advises the fumes of tobacco, or an

enema of the infusion of male fern. (*Polypodium flex. mas.*)

As these worms most commonly affect young children, it is of great consequence to have the medicines exhibited in as small bulk as possible. The following can be given disguised in a little jelly, &c.

℞ Pulv. Aloes, gr. xvi.

—— Scammoniaë, gr. viij.

Sacchar. Alb. ℥i. Misce.

To be divided into four or eight powders, according to the age of the child ; one powder every morning.

The following injection is then to be given :—

℞ Ol. Terebinth. ℥ij.

Ol. Olivar. ℥ij. Misce, pro enema.

Or,

℞ Pulv. Aloes, ℥ss.

To be dissolved in a little milk or gruel for an injection.

The quantities in both the above to be doubled, if necessary, according to age, &c.

The infusion of tobacco, also, in the proportion of ℥i. of leaves to 1 lb. boiling water, letting it stand ten minutes, is also a powerful enema.

These worms will sometimes be found difficult to eradicate. Though thousands are expelled,

yet they increase with astonishing rapidity. Cold bathing of the parts, night and morning, will be found highly beneficial, and attention to diet, &c. to be mentioned afterwards.

Sometimes these worms escape from the anus, and creep into the vagina, thereby causing great irritation. Injections of equal parts of cold water and vinegar, repeated frequently, will be found to destroy them; and means are at the same time to be used for their eradication from the bowels.

OF THE CURE OF THE LONG ROUND WORM,
(ASCARIS LUMBRICOIDES.)

THESE worms are found in the small intestines, and feed on the pure chyle. Children are peculiarly liable to have them, although they are not uncommon in adults also. The symptoms attending their presence are different from those of the small thread worm, but cannot be distinguished generally from those attending *tænia*, or tape worm. They also sometimes may exist without causing much or any disagreeable irritation. On the contrary, nausea, sickness, griping about the umbilical region, and, when they ascend into the stomach, retching and vomiting are very frequent indications of their presence.

Dr Bremser's method of cure for this species consists in giving for a child one tea-spoonful of the electuary marked No 1., every morning, for some time. A discharge of glairy matter first

takes place, and after the continuance of the medicines the worms are expelled. The doze may be doubled or trebled, if necessary, according to circumstances or age of the patient.

If purging is found necessary, one of the powders marked No 3. may be exhibited.

After these medicines have been persevered in for a sufficient length of time, the tonic drops, No 5., are to be taken daily, if the patient be of a lax and delicate habit. The empyreumatic oil of Chabert, and the oil of turpentine conjoined with castor-oil, to be more particularly mentioned when treating of the cure of tape worm, may be administered with advantage in the case of round worms also.

These worms are generally easily expelled; but, to ensure this completely, as also the destruction of their eggs, it is proper to persevere with the vermifuge medicines for some considerable time, and to keep up a continued action in the intestinal canal. A combination of medicines, too, which act on every part of the alimentary canal in succession, will be found the most complete and efficacious.

The following formulæ will be found useful, and as they can be administered in little bulk, are particularly adapted for children:—

R Calomel, gr. xxiv.

Pulv. Jalapæ, ℥iss.

—— Scammoniæ, gr. xxiv.

—— Zinziber. ʒi.

Misce et divid. in pulv. xii. æqual.

One to be taken in a little jelly every morning.

The same proportion of medicines to be divided into eight powders for a child of twelve or fourteen years, and into six powders for an adult.

Tonic Powders.

R Sulph. Quinin. gr. xij.

Carbon. Ferri, ʒi.

Pulv. Sulph. Ferri, gr. x.

Misce et divid. in pulv. xij.

One powder, twice a-day, in a little jelly.

The same for an adult.

R Sulph. Quinin. gr. xxx.

Carbon. Ferri, ʒij.

Pulv. Sulph. Ferri, ʒi.

Misce et divid. in pulv. xij.—one twice a-day.

To those liable to be affected with the large round worm, but especially when it occurs in

children, an attention to diet and to the state of the digestive system will be found of the greatest importance as a preventive of future attacks.

Patients, then, should abstain from all crude, raw, and indigestible vegetable food, from too much saccharine matter, oily substances, unripe fruit, and a diet in which milk too much preponderates, or the substances prepared from milk, as cheese and butter.

The food, on the contrary, should consist of light and easily-digested substances. Animal food should constitute a principal part of the diet. A moderate meal only should be made at a time; and, when the digestion is not good, some of the usual condiments taken along with the food will be found advantageous. Regular exercise, too, in the open air, and every thing which has a tendency to strengthen the fibre and improve the general health, will be found highly beneficial.

In robust habits, again, care should be taken that the food is not too rich, or taken in too great quantity; and regular bodily exercise should be daily persevered in.

Scrofulous children, who are peculiarly liable to worm-affections, will be much benefited by a regular course of mild laxative medicines, and attention to diet, clothing, &c.

Lime-water has been found occasionally useful to correct the mucous glairy state of the bowels; and a slight course of calomel, when the disposition to worms is found obstinate, is often of the greatest service.

Spirituous liquors, when taken into the stomach, appear to be a preventive of worms, and to destroy them when present; their moderate use, therefore, as stimulants, especially in damp moist situations, may be found useful and salutary.

Ale, and other fermented liquors, are, on the contrary, more objectionable.

OF THE CURE OF THE BOTHRIOCEPHALUS AND
TÆNIA, OR TAPE WORM.

THE method of cure for the two species, *bothriocephalus lata* and *tænia solium*, which both pass under the general denomination of tape worm, is the same ; and, therefore, they are here considered under the same head.

These worms are the most difficult to dislodge, and the most prejudicial to the system, of all those which infest the human intestines. From the great length to which they grow, occupying in many cases the whole range of the small intestines from the lower orifice of the stomach downwards,—from the pertinacity with which they adhere to the coats of the intestines,—from the consequent irritation which their presence must cause, and the great consumpt of the chyle necessary for the due nourishment of the body,

they are generally the cause of excessive uneasiness, great derangement of the alimentary functions, and emaciation of the whole body. Sometimes this weakness is such, that the sufferers are incapable of all bodily exertion; and the number of joints passed almost daily often amounts to thirty or forty. Patients have been known to suffer under tape worms for three, five, and even seven years. An effectual method of destroying these worms, then, is of the utmost importance; and, accordingly, we find that a variety of cures for that purpose have been in general use.

We shall first notice Dr Bremser's method of cure. He tells us that he has treated more than 500 persons of different ages, affected with tape worm, with uniform success; so much so, indeed, that not one of his patients, after undergoing the proper course of medicines, has had occasion to apply to him a second time for the same affection.

First of all, he commences by giving the electuary No 1. for several mornings in succession. When this has been continued for some

time, he commences with the empyreumatic oil of Chabert, (to be afterwards described,) in doses of two tea-spoonfuls, mixed with a little water, morning and evening. If this dose be found too large, one-half the quantity may be given, and the dose to be increased or diminished according to its effects. If this medicine should affect the bladder, an emulsion of oil, mucilage, or other bland liquid, is to be taken frequently, to correct the disagreeable symptoms.

After persevering in this course for ten or twelve days, and when two and a half or three ounces of the medicines have been consumed, the purgative powders marked No 3. are to be taken. Four or five ounces of the oil are generally sufficient to effect a cure; or, in obstinate cases, six or seven ounces. The medicine must be continued for some time, to ensure the complete eradication not only of the worms but of their eggs.

It is only when there is a disposition to form glairy matter in the intestines, that Dr Bremser thinks it necessary to administer the tonic tincture, No. 5., after the bowels have been cleared

of the worms. He restricts his patients to no particular regimen, except forbidding them the use of dry leguminous substances, too much farinaceous diet, and all substances of an oily and fatty nature.

A proof that the cure has been complete is, that, after the lapse of three or four months, no trace of worms can be perceived. If after that period they should appear, it must be looked upon as a new disease.

Dr Bremser considers the empyreumatic oil of Chabert a most effectual cure for intestinal worms, and especially for tape worm,—so much so as to supersede the use of all other remedies. Rudolphi, also, bears testimony to its complete success as a medicine; and its extensive, and indeed universal, use on the continent exemplifies its efficacy. It is composed of one part of empyreumatic animal oil and three parts of oil of turpentine. The taste is nauseous, and to most people very disagreeable, and, when given even in moderate doses, is apt to produce nausea, griping, and very frequently irritation of the

bladder and strangury ; the dose, therefore, should be begun small, and increased gradually.

It is very probable that the active ingredient in this medicine is the oil of turpentine ; for this latter substance is used in this country for the cure of tape worms with complete success, and in doses which would astonish the more timid continental practitioners. Dr Blainville, in his notes to Dr Bremser's work, is of opinion, that the doses of the German physician are too large when he orders two tea-spoonfuls of the oil of Chabert ; but, in this country, from one drachm to an ounce and upwards of the oil of turpentine has been given without producing any bad effects, and in enemata from half an ounce to two ounces frequently. A very useful and efficacious mode of exhibiting it is in conjunction with castor-oil, as in the following formula :—

R Ol. Terebinth. ℥ij.

Ol. Ricini, ℥i.

Mucilag. G. Arabic. ℥ss.

Syrup. Simp. ℥ss. Misce.

To be taken, divided into two or three doses.

The oil of turpentine, when taken alone, is very apt to pass off by the urinary vessels, and to affect the neck of the bladder, thereby causing great irritation, and often strangury. By being conjoined with the castor-oil, it more readily passes off by the bowels ; and, exhibited in this manner, is a sure and efficacious remedy against the most obstinate cases of *tænia*, and may also be given for the expulsion of the round worm and small thread worm ;—for the latter either by the mouth, or what is far better, in the form of an enema. During the exhibition of the medicine the patient should drink copiously of bland broths, such as beef-tea, &c. ; and if there is any irritation of the bladder, the free use of an infusion of lintseed will be found to allay the uneasiness and pain. Some patients cannot bear more than from twenty to thirty drops of the oil of turpentine, while others can take one to two drachms with impunity ; the dose, therefore, should be cautiously regulated at first, so as not to frighten or disgust the patient.

After this medicine has been persevered in

for a sufficient length of time, giving moderately small doses, but keeping up a continued action in the bowels, until all traces of the worms have disappeared, the next object is to prevent the future formation of these animals. For this purpose, if the patient is of a weak habit, with relaxed bowels, Dr Bremser's tonic tincture, No 5., may be given, or any of the following :—

R Sulph. Quinin. gr. ij.

Acid Sulphur. Aromatic. gtts. xxv.

Aq. Fontis, ℥ij. Misce.

Draught to be taken morning and noon.

Or,

R Carbon. Ferri, ℥ij.

Pulv. Rhæi Ind. ʒss.

Pulv. Colombæ, ℥ij. Misce et divid. in pulv. xij.

One powder, twice a-day, in a little jelly.

If, on the contrary, the predisposition to the disease should be occasioned by an undue balance between the digestive and absorbent systems,—by too great a consumption of nutritious food, or any similar cause already mentioned, an attention to diet, exercise, and all other circumstances conducive to general health and vigour,

will be found advantageous as a preventive of the recurrence of this most troublesome affection.

As the other species of worms are met with most commonly in children, it will be found that the tape worm, on the contrary, is more a disease of adults; and that, as has been already mentioned, it prevails more in some countries and particular districts than in others.

DR BREMSER'S FORMULÆ, REFERRED TO IN THE
PRECEDING PAGES.

No 1.

℞ Sem. Cinæ Tanacet. Rud. Contus, ℥ss.

Pulv. Valerian. ℥ij.

—— Jalapæ, ℥iss. ℥ij.

Sulph. Sodæ, ℥iss. ℥ij.

Oxymel Scillæ, q. s. ut ft. electuarius.

Dose, two or three tea-spoonfuls in a morning.

No 2.

℞ Herb. Absynthii.

Rad. Valerian. āā ℥i.

Semen. Tanacet.

Cort. Aurantior, āā ℥ss.

Infuse in a pint of boiling water for a night, then strain.

To be used for two injections.

No 3.

℞ Pulv. Rad. Jalap. ℥i.

Fol. Sennæ, ℥ss.

Sulph. Sodæ, ℥i.

Divid. in pulv. 3 vel 4.

One to be taken every hour, or half-hour, till the bowels
are opened.

No 4.

Huile Empyreumatique de Chabert.

Take of empyreumatic oil from hartshorn one part, oil of turpentine three parts, mix them in an iron retort, and distil in a sand bath, until three-fourths come over. The distilled liquor is then to be put into small bottles, and carefully excluded from the air and light, to prevent its decomposition. Dose—Two tea-spoonfuls, morning and night, in a glass of water.

No 5.

Tonic Tincture.

R Tinct. Alois Compos. ℥i.

Tinct. Ferri Muriat. ℥i.

Acid. Sulphur. Aromatic. ℥ss. Misce.

Ten, twenty, or thirty drops, to be taken three or four times a-day, in a little water or wine.

This latter prescription is allowed by Dr B. to be an unchemical one, from the decomposition that takes place on the mixture of the sulphuric acid with the muriate of iron; yet long experience, he says, has proved its efficacy as an excellent tonic.

VARIOUS REMEDIES USED FOR THE CURE OF
TAPE WORM.

Stoerk.

℞ Sal. Polychrist.

Pulv. Rad. Jalap.

Valerian Sylvest. āā ℥i.

Oxymel Scillæ, ℥iv. Misce.

Dose for adults, ℥ss. four times a-day.

Clossius.

℞ Terebint. Venet. ℥i.; solv. in Vitell. Ovi q. s. et ad. Aq.
Menth. Piperit. ℥iv. To be taken in tea-spoonfuls, at
intervals.

The celebrated Nostrum of Mathieu.

(Long time kept secret, but published at last by Hufeland in his *Journal*.)

A. ℞ Limatur. Stann. Angl. pur. ℥i.

Rad. Filicis Mar. ℥i.

Pulv. Semin. Cinæ, ℥ss.

—— Rad. Jalap.

—— Salis Polychrist. an. ℥i.

Misce, ft. cum mell. commun. q. s. electuarium.

A tea-spoonful every two hours, for two or three successive mornings.

B. R Pulv. Rad. Jalap.

— Sal. Polychrist. āā ʒij.

— Scammon. Alepp. ʒj.

Gummi Guttæ, gr. x.

Misce, ft. c. mell. electuarius.

A tea-spoonful every two hours, in the mornings, successively, after using the electuary marked A.

Richard de Hautesierck.

Bolus.—R Gum. Guttæ, gr. x.

Semin. Colocynth. No iij.

C. Amygdal. Amar. No l.

Triturantur et c. Syrup. Absynth. ft.

Bolus to be taken every second morning.

Pills.—R Alois Socot.

Assafœtid. āā ʒi.

Salis Absynth. ʒss.

Ol. Roris Marin. ʒii.

C. Elix. Ppt. ; ft. Pill. gr. x. pond. s.

Two pills to be taken morning and evening, and drink after it six oz. decoction of male fern, (filix mas).

The famous Specific of Mad. Nouffer

Consists of a decoction of the root of Male Fern, followed
by this Purgative Bolus:—

R Mercurii Sublim. four parts.

Scammon. Alepp. six grains.

Gum. Guttæ, six or seven grains.

Misce and form into a confection.

The active ingredients of all the empirical worm medicines sold in this country, such as Ching's Lozenges, Storey's Worm-Cakes, &c. &c. consist of calomel, jalap, and scammony.

OF THE LARVÆ OF INSECTS AND OTHER ANIMALS
FOUND IN THE HUMAN STOMACH AND INTES-
TINES.

THAT the larvæ of the various species of insects, as well as other worms and reptiles which naturally inhabit the earth, find their way into the human body, are capable of existing there for a considerable length of time, and are often voided either by the mouth, or *per anum*, in a living and perfect state, are facts which the daily experience of medical men can vouch for. It would appear that these animals are capable of resisting the action of the gastric juice, and other processes of digestion; and such a circumstance goes far to confirm the observation often made, that this fluid only acts upon dead matter. It would seem, too, that these animals have access to air also in the stomach and intestines; for many species are voided alive to whose exist-

ence respiration in some form is absolutely necessary.

In the fourth volume of the Transactions of King's and Queen's College of Physicians in Ireland, there is a very singular case given by Dr Pickells, of a young woman who discharged at different times an immense quantity of insects from her stomach, chiefly of the beetle tribe, (the *blaps mortisaga*, and *tenebrio molitor*.) "Of the larvæ of the beetle," says Dr Pickells, "I am sure I considerably underrate when I say, that independently of above a hundred evacuated *per anum*, not less than seven hundred have been thrown up from the stomach, at different times, since the commencement of my attendance. The larvæ of the beetle were, with few exceptions, lively in the extreme; nor was it possible, without a feeling of horror, to view them frisking along the bottom of the vessel in which they were preserved, occasionally expanding their jaws, and extending their denticulated feet, or 'talons,' as their unfortunate victim used to call them. The larvæ of the dipterous insect, though voided only about seven or eight

times, according to her account came up almost literally in myriads," (pp. 207, 8.) From this case, too, it would appear, that the *larvæ*, *pupæ*, and *imago* of the same insects were successively discharged from the same individual; thus establishing the interesting fact, that the different successive metamorphoses of insects may take place in the human intestines during life.

The larvæ of the various species of moths, of the common flesh-fly, &c. I have repeatedly seen voided from the bowels. The larvæ of the *tenebrio molitor*, or meal beetle, too, is met with very frequently. A young girl of three years of age, a patient of Dr Mackintosh of this city, has repeatedly voided quantities of the common earth worm, (the *lumbricus terrestris*,) several of which, quite alive, I have, through the kindness of Dr Mackintosh, myself examined. It would appear that the child, from an unnatural appetite, is in the practice of swallowing quantities of earth, &c. Along with the worms were also observed the larva of another small insect.

The following case was communicated to me by Mr A. Anderson, Surgeon, Haddington. Mr

Anderson attended the patient, and, to prevent any suspicions of imposition, had the declarations of the patient and his wife, as to the truth of the whole circumstance, taken before a respectable justice of the peace in the neighbourhood, a copy of which declaration is now before me :—Robert Dixon, farm-servant, Markle, Haddingtonshire, was, in the summer of 1826, engaged in driving lime to the fields, and was in the habit of frequently drinking from the ditches on the road-side. In the end of the same year his disorder commenced with an increased desire for food, a vomiting up of fetid slimy matter from his stomach, which made him cough, and with which he was attacked two or three times a-day; nearly half a pint would come up at a time, accompanied with sour belchings and eructations, and a most obstinate state of bowels, five or six days sometimes intervening without a stool. He felt a swelling and fulness of the right superior portion of the stomach, which was very painful when pressed. Slept very well, except on his right side; for, when he attempted to lie upon it, an almost continued working up

of the slimy matter took place, which made him sit up, and brought on cough.

He continued in this state till June, 1828, using a variety of medicines, and undergoing a variety of medical treatment, without any relief.

On the 17th June, Mr Anderson was consulted, and ordered him a strong solution of carbonate of soda, and pills of calomel, hyoscyamus, and extract of gentian. On the second day after the exhibition of these medicines, in one of his severe fits of vomiting, he ejected from the stomach an animal of about four inches in length, which proved to be the common species of gray snail, (the *limax major*.) It was quite lively and vigorous when voided, and lived in Mr Anderson's possession for five days afterwards. After this the patient's distressing symptoms of vomiting, &c. disappeared, and he is now (10th October) about to resume his usual occupation.

EXPLANATION OF PLATE I.

- FIG. 1. The male *Trichocephalus*, the size of nature.
2. Magnified view of the same ; c. the head ; d. the tail, with the projecting penis and sheath.
3. The female *Trichocephalus*.
4. Magnified view of the same ; f. head ; e. tail.
5. The tail of the male *Trichocephalus*.
6. The female *Oxyuris*.
7. The same magnified.
8. The male *Oxyuris*.
9. The same magnified.
10. Another female *Oxyuris* magnified.
11. A portion of the worm greatly magnified, showing the oviducts containing the eggs.
12. The *Ascaris Lumbricoides* ; a. the head ; b. the tail ; g. the depressed band.

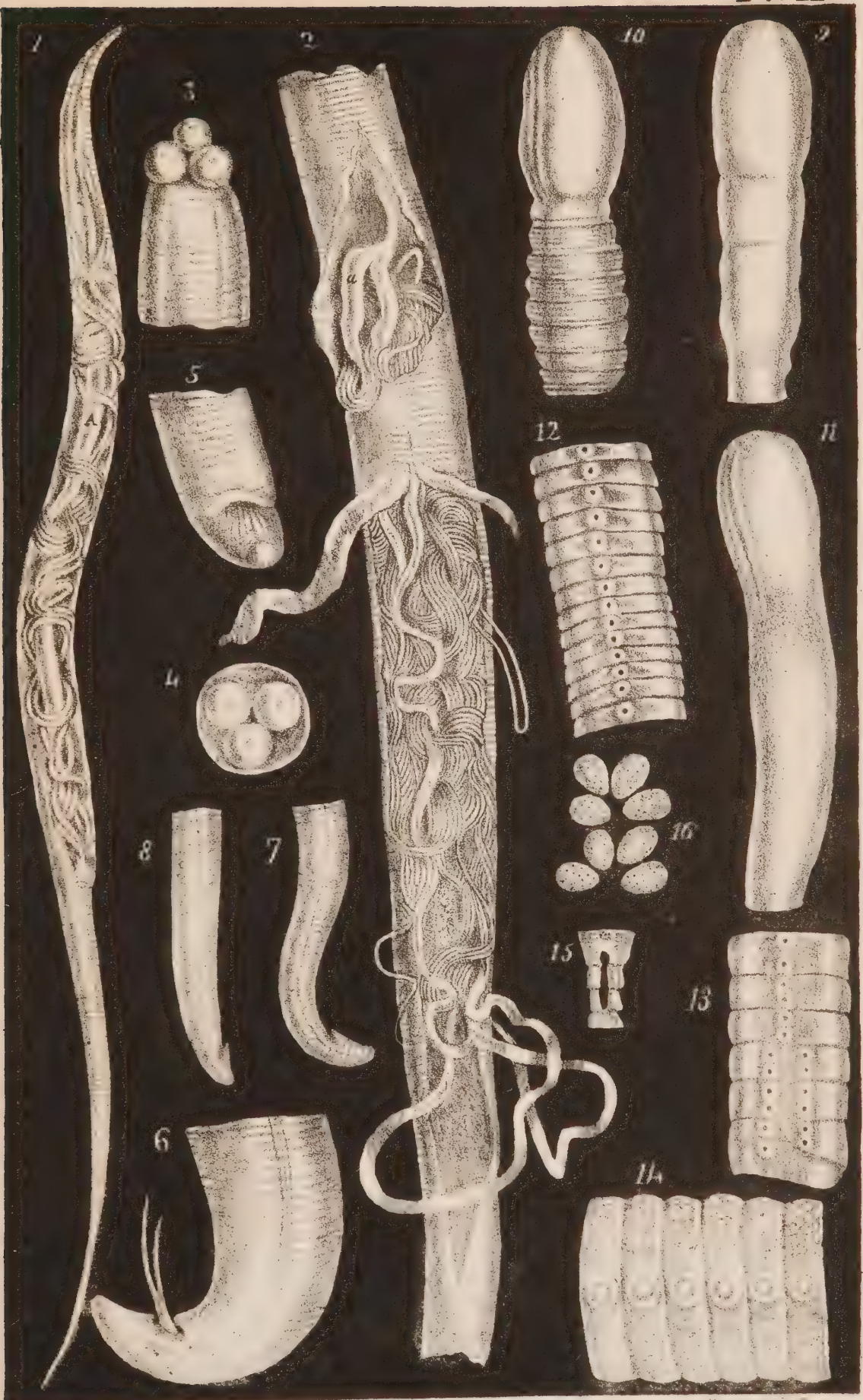


Drawn & Lithographed by Capt. Brown.

Printed by J. H. Smith.

EXPLANATION OF PLATE II.

- FIG. 1. Magnified view of the female *Oxyuris*, showing the oviducts surrounding the alimentary canal.
2. Magnified view of the female *Ascaris Lumbricoides*, with the convoluted oviducts ; a. the bifurcated tube or vagina.
- 3, 4. Views of the head of this worm, with the three papillæ, magnified.
5. The tail and anus magnified.
6. The tail of the male greatly magnified, with the projecting penis.
7. The curved tail which distinguishes the male.
8. The straight tail of the female.
- 9, 10, 11. Heads of the *Bothriocephalus*.
12. A portion of the *Bothriocephalus*, showing the oscula, or central suckers.
13. Another portion, with a double row of oscula.
14. A portion of the same greatly magnified, showing the ovarian vessels surrounding the oscula.
15. A portion of the same, showing a double row of joints.
16. The eggs greatly magnified.

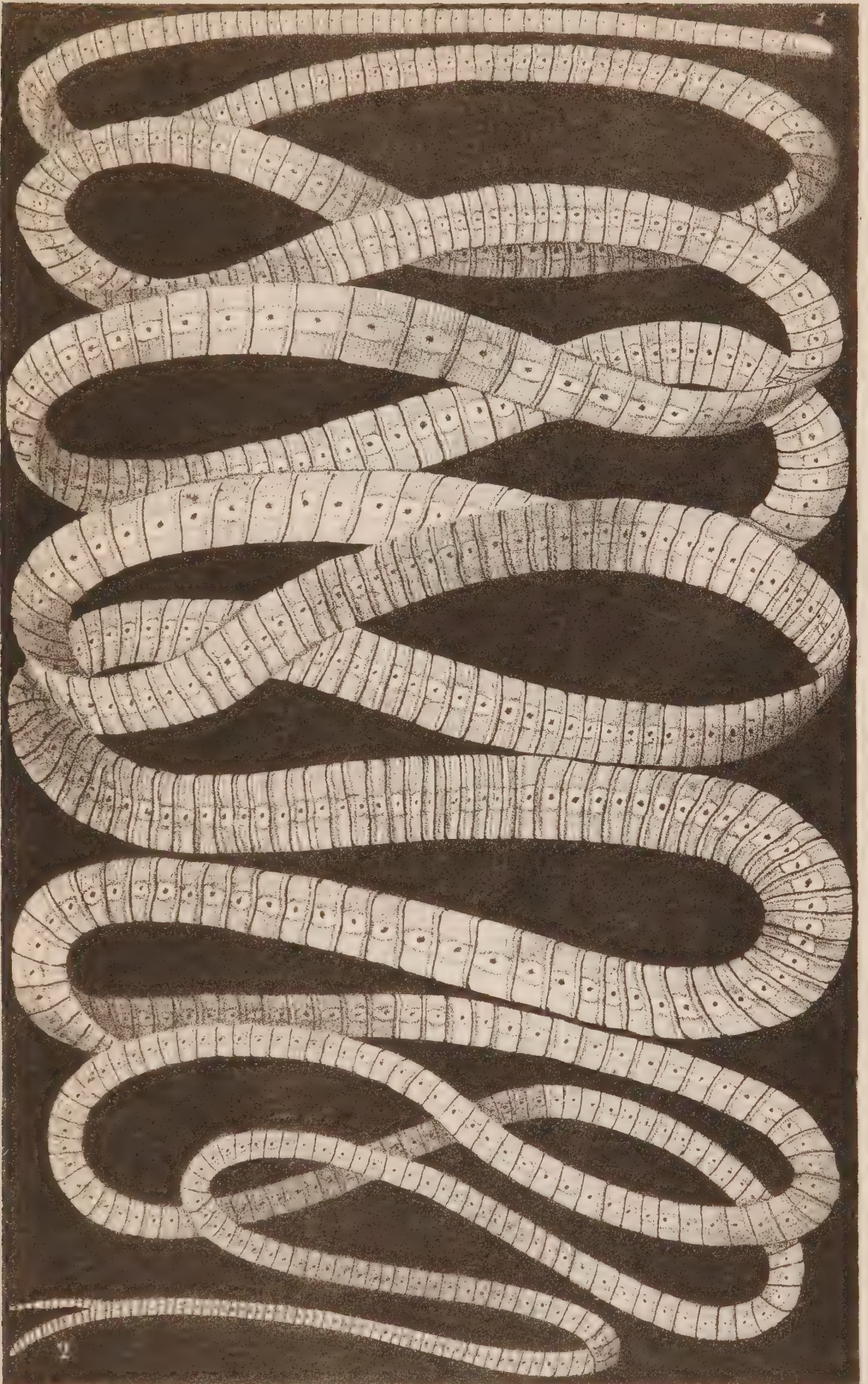


Thos Brown feci

Simulans Linn.

EXPLANATION OF PLATE III.

Bothriocephalus Latus. Fig. 1. head ; fig. 2. bifurcated tail.



EXPLANATION OF PLATE IV.

- FIG. 1. Head of *Tænia Solium*, much magnified, showing the mouth, and four lateral oscula or suckers.
2. Head of *Tænia Solium*, much magnified, with the mouth in its centre, and showing the stellated radii.
3. Head of *Tænia Solium*, greatly magnified, with a neck.
4. a. Head of *Tænia Solium*, size of nature. From this to fig. 4. are various articulations in different parts of the body.
5. 8. 10. Articulations of the most prevailing shape in *Tænia*.
6. Articulations very much elongated, from a specimen in Dr Mackintosh's museum.
14. The lower articulations of this figure are broader than long, in this respect resembling the general appearance of *Bothriocephalus Latus*.
13. Irregularly distorted articulations of *Tænia*.
11. Imperforated articulations of *Tænia*.
7. A portion of *Tænia* injected, showing the situations of the alimentary canal on each side.
12. Monstrosities, or deformed articulations of do.
9. Articulations very much retracted of do.
15. Ovula of *Tænia*, size of nature.
16. The same magnified.
17. A dissection of *Oxyuris Angulata*, greatly magnified, showing the œsophagus, alimentary canal, and oviducts.





EXPLANATION OF PLATE V.

- FIG. 1. *Filaria Medinensis*, or Guinea Worm.
2. *Hamularia Subcompressa*.
 3. Head and part of the body of do., considerably magnified.
 4. *Strongylus Gigas* ; a. the tail ; b. the head.
 5. Tail of male *Strongylus*, considerably magnified.
 6. Tail of female, do.
 7. Head of male *Strongylus*, much magnified.
 - 8, 9. Small worms voided with the urine, the size of nature.
 10. Do. considerably magnified.
 11. The head of do., considerably magnified.
 12. Extremity of the tail of do., considerably magnified.
 13. *Oxyuris Angulata*, female, size of nature.
 14. Do., considerably magnified.
 15. Head of do., greatly magnified.
 16. Transverse section of do. do.
 17. Tail of do. do.
 18. *Oxyuris Angulata*, male, considerably magnified
 19. Head of do., greatly magnified.
 20. Transverse section of do. do.
 21. Tail of do. do.



EXPLANATION OF PLATE VI.

- FIG. 1. *Distoma Hepaticum*, size of nature.
 2. Do., considerably magnified.
 3, 4. *Polystoma Pinguicola*.
 5. Do., suckers on the side-organs.
 7. *Cysticercus Cellulosæ* of the cellular tissue, with a small piece of the muscle, containing several individuals the size of nature.
 6. An individual of the above, with the tail half developed.
 8. The same, with the head and tail completely developed.
 9. The *Echinococcus*.
 10. Do. of a large size.
 11. The same, showing the appearance of an individual contained inside, of which the internal membrane is detached.
 12. *Ditrachyceros Rudis*.
 13. *Ascaris Stephanostoma*.
 14. *Ascaris Conosoma*.
 15. *Cercosoma*.
 16. *Hexathyridium Venarum*.
 17. *Diacanthos Polycephalus*.
 18. *Hydrometra Hydatica*.
 19. *Tenebrio Molitor*, size of nature, see p. 138, 9.





